DOCUMENT RESUME

ED 153 398 EC 110 347

AUTHOR	Gadow, Kenneth D.
TITLE	Drug Treatment with Children in Programs for the Trainable Mentally Handicapped.
INSTITUTION	Illinois Univ., Urbana. Inst. for Child Behavior and Development.
SPONS AGENCY	National Inst. of Child Health and Human Development (NIH), Bethesda, Md.
PUB DATE	May 78
GRANT	HD-05951
NOTE	81p.; Paper presented at the Annual International Convention, The Council for Exceptional Children (56th, Kansas City, Missouri, May 2-5, 1978, Session T25)
EDRS PRICE	MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS	*Drug Therapy; Elementary Secondary Education; Exceptional Child Research; Mentally Handicapped; *Special Education Teachers; Surveys; *Teacher Role; *Trainable Mentally Handicapped

ABSTRACT

In order to describe the extent of drug treatment with mentally retarded children in public schools and the involvement of teachers in the drug regimen, a study was designed to survey teachers of the trainable mentally handicapped by mail about psychotropic and anticonvulsant drug use with the children they were teaching. The study was divided into two different phases plus an interview study to validate teacher reports. Objectives of Phase One were to: (1) determine the number of children who received medication during the school year and the reasons for which the drugs were prescribed; (2) characterize teacher experience with children receiving medication for learning, behavior, and convulsive disorders; (3) describe teacher training about drug therapy with children; and (4) identify problems teachers encountered with children receiving medication, their parents, and physicians. Phase Two objectives were to: (1) describe teacher involvement in each stage of the drug regimen; (2) determine how drugs are administered and stored at school; and (3) identify problems teachers encountered with specific children receiving drug treatment. (Findings are discussed and statistical data presented for each of the study objectives.) (SBH)

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ED153398

Drug Treatment with Children in Programs for the Trainable Mentally Handicapped[1]

Kenneth D. Gadow[2]

Institute for Child Behavior and Development
University of Illinois at Urbana-Champaign

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NATIONAL INSTITUTE OF EDUCATION

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Paper presented at the annual meeting of the Council for Exceptional Children, Kansas City, May 1978.

The use of drug treatment in the management of childhood behavior disorders has generated considerable attention in recent years. Although the application of medication deemed effective in the management of adult psychiatric problems to childhood disorders is perceived as a considerable advance in pediatric health care (Gittelman-Klein, 1975), a number of questions have been raised about the quality of research with which these agents have been evaluated, harmful side effects, and the manner in which they are used. Until quite recently, the methodological procedures used in many studies evaluating the effectiveness of medication in the treatment of childhood behavior disorders were often lacking in even the most fundamental steps to ensure an unbiased assessment (Sprague & Werry, 1971). This, combined with the realization that very few studies had actually been conducted in relation to the number of children being treated (Di Mascio, Soltys, & Shader, 1970) and the secondary emphasis placed on learning and behavioral criteria for evaluating the efficacy of treatment (Sprague & Werry, 1971, 1974) raised concerns about the ability of the medical profession to evaluate pharmacological intervention.

Another area of concern, the safety of therapeutic drugs, focuses on two issues. One is whether or not medication produces harmful side effects to include impairment of learning ability and classroom performance. The second issue is the question of possible iatrogenic effects, e.g., whether childhood drug treatment contributes to drug abuse in later life (Ladd, 1970). Much has yet to be learned about possible long term effects of drugs used in the control of behavior disorders (Di Mascio, Soltys, & Shader, 1970), and the relationship between dosage and cognitive impairment is only beginning to be investigated in a meaningful way (Sprague & Sleator, 1975). As for any functional relationships between therapeutic drug treatment during childhood and later drug abuse, very little can be said with any certainty (Beck, Langford, Mackay, & Sum, 1975).

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[1]This study was based on a doctoral dissertation completed by the author in partial fullfillment of the Ph.D. requirement at the University of Illinois, Urbana-Champaign and was supported in part by Public Health Service Grant No. HD 05951 from the National Institute of Child Health and Human Development.

[2]Dr. Gadow's present position is Assistant Professor, Office of Special Education, Social & Behavioral Sciences Bldg., State University of New York at Stony Brook, Stony Brook, New York 11794.

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Researchers and clinicians have also been concerned about the way in which drug treatment is used. Allegations have been made that drugs are prescribed in a cavalier manner without proper diagnostic procedures (Walker, 1974). The adequacy of existing monitoring procedures has also been called into question (Gadow, 1977a; Loney & Ordoña, 1975; Solomons, 1973). Another issue is whether or not schools over refer children suspected of having learning or behavior problems and encourage the use of medication with children who clearly should not be placed on drug treatment (Schrag & Divoky, 1975). Other issues related to the manner in which drugs are used are overmedication with a focus on symptom suppression instead of responsiveness to treatment (Sprague & Werry, 1971, 1974), and more recently, child preceptions about taking medication and control over therapeutic self-improvement (Whalen & Henker, 1976). Unfortunately, very little data are available on the psychosocial aspects of drug treatment (Sprague & Gadow, 1976).

Similar concerns have also been expressed about the drugs used in the management of convulsive disorders. For example, Stores (1973, 1975) pointed out that very little research has ever been done on the effect of drugs used for the control of seizures and convulsions on learning, cognition and performance. In like manner, Reynolds (1975) recently reported that the literature about the effects of long term toxic levels of antiepileptic drugs had never even been reviewed and that much was yet to be learned. Another concern has been the suppression of seizures at the expense of the child's ability to learn and perform in the classroom (Crowther, 1967; Dekaban & Lehman, 1975; Livingston, 1972). Clinicians have also raised questions about the manner in which these drugs are administered to include overmedication to suppress behavior problems, poor monitoring procedures, and undesireable cosmetic changes as sequelae of phenytoin (Dilantin) treatment (Schain, Note 1). It should be pointed out, however, that many of the drugs presently used in the control of convulsive disorders are truly miracles of modern pharmacological research, and frequent uncontrolled convulsions have tragic psychosocial consequences.

Drugs that are prescribed primarily for their effects on mood, thought processes, and behavior are collectively referred to as psychotropic drugs. A number of different classification schemes have been used to subdivide this category of drugs, and a variety of labels are used in the literature to describe the same subcategory (Leavitt, 1974; Usdin, 1970). To minimize confusion, the psychotropic medications discussed in this paper have been grouped according to six categories proposed by Usdin and Effron (1972). These are psychostimulants, major tranquilizers, minor tranquilizers, antidepressants, hypnotics, and sedatives. Anticonvulsant or antiepileptic drugs, as the names imply, are used in the management of convulsive disorders. Because many psychotropic drugs have anticonvulsant properties, there is considerable overlap between these two groups. To simplify matters, drugs used primarily for convulsive disorders will be referred to as anticonvulsants and the rest as psychotropics. It would be inappropriate

however, to infer the reason for which a drug is prescribed from its assigned label. For example, the antidepressant imipramine (Tofranil) may be used in the management of depression and panic anxiety (Honigfeld & Howard, 1973), enuresis (Blackwell & Currah, 1972), hyperactivity (Rappaport, Quinn, Bradbard, Riddle, & Brooks, 1974), separation anxiety (Gittelman-Klein, 1975) and convulsive disorders (Lange, Julien, & Fowler, 1976).

To add to the confusion, drugs have both generic and trade names. The generic name is typically used in scientific literature and is not controlled by a specific manufacturer. The trade name is a registered trademark. In this discussion drugs are referred to by generic name with the trade name in parentheses. However, trade names were used in the research tools developed for this study and are used in the text to denote respondent reports.

Psychotropic and anticonvulsant drugs are used in the management of a number of childhood disorders including aggressive outbursts, autism, cerebral palsy, convulsive disorders, hyperactivity, phobias, psychoses, separation anxiety, stereotyped behavior, and tics (Campbell, 1975a, 1975b; Conners, 1972; Denhoff, 1966; Freeman, 1970a, 1970b; Gittelman-Klein, 1975; Sprague & Sleator, 1973; Sprague & Werry, 1971, 1974). Three types of childhood disorders, hyperactivity, behavior problems, and convulsive disorders, are of particular interest because of their relatively high prevalence, responsiveness to drug treatment, and concomitance with mental retardation.

Disorders Associated with Mental Retardation

The prevalence of behavior problems is much greater among mentally retarded children compared to their nonretarded age mates. A study of 9- to 11-year-old children on the Isle of Wight showed this relationship holds up whether the source of information is parent or teacher behavioral ratings or psychiatric examinations (Rutter, 1971; Rutter, Tizard, & Whitmore, 1970). Teachers considered 42% of the retarded children disturbed compared to only 9.5% of the children in a randomly selected control group. Among the retarded children, I.Q. less than 80, the more common indices of disturbed behavior were poor concentration, fearfulness, fidgety, and fighting.

Payne, Johnson, and Abelson (1969) conducted what must certainly be one of the most comprehensive surveys of the mentally retarded in residential facilities. Twenty-two institutions in the Western United States were asked to provide detailed data on a total of 24,257 residents in 1968. Ward personnel made behavioral ratings using a 4-point scale: never, seldom, occasionally, and frequently. Of primary interest were behaviors considered maladaptive, i.e., interfered with institutional programming. The most common behaviors rated "frequently" were hyperactive (18%), aggressive (10%), runs and paces (8%), and several items with a 5% prevalence (self-destructive, requires restraints, destroys clothing, and attacks residents). Twenty-one percent of the residents were characterized as occasionally hyperactive and/or aggressive.

Jenkins and Stable (1971) analyzed case records of 3,847 mentally retarded children in both public schools and residental facilities. The records were housed in a central file for purposes of information sharing and educational program planning. Thirty percent of the children were either mildly, moderately, or severely hyperactive, distractible, and inattentive. A matched pair comparison between a sample of severely hyperactive and nonhyperactive children showed a significantly greater number of hyperactives had a history of seizures and residual speech defects and were characterized as destructive, withdrawn, assaultive, and overanxious.

As with hyperactivity and behavior problems, the prevalence of convulsive disorders among the moderate to profoundly retarded is greater than among the general population. Schain (Note 1) has described the relationship between the two disorders as "linked together epidemiologically, etiologically, clinically, and therapeutically." Although convulsive disorders do not appear to be any more extensive among borderline and mildly retarded persons than the general population (Slater & Cowie, 1971), estimates for severe and profoundly retarded in residential facilities are as high as 30% (Jasper, Ward, & Pope, 1969).

Although hyperactivity, behavior problems, and convulsive disorders have been discussed separately, they frequently occur in combination. Hyperactivity and behavior problems are frequently associated (Safer & Allen, 1976; Wender, 1971) as are convulsive disorders and hyperactivity (Ounsted, 1955) particularly among the mentally retarded (Jenkins & Stable, 1971; Millichap, 1969). Gadow (1976) reported that at least 1.1% of the children in early childhood special education programs were receiving drugs for both hyperactivity and convulsive disorders. Similarly, Sprague (1977) reported combinations of psychotropic and antiepileptic drugs in a survey of two residential facilities for the mentally retarded. Of the residents in the large facility, 21% were administered both types of drugs and 12% in the smaller institution.

There is overwhelming evidence demonstrating a higher prevalence of behavior problems among epileptic school-age children than for non-epileptic children (Graham & Rutter, 1968). The data comparing retarded individuals with and without seizures are also consistent with this finding. Eyman, Moore, Capes, and Zachofsky (1970) used a matched pair procedure to compare behavioral ratings for 1,159 mentally retarded patients with convulsive disorders to a sample matched by age and sex without a history of convulsive disorders. The two groups differed significantly in terms of behavior problems and developmental delays with the patients with convulsive disorders demonstrating a greater degree of both.

Pattern and Prevalence of Drug Treatment with the Mentally Retarded

Only a few studies provide data on the prevalence and pattern of psychotropic and antiepileptic drug treatment with the mentally retarded. In 1967, Lipman (1970) sent questionnaires about psychotropic drug use to all state and private institutions for the mentally retarded listed in the Directory of Residential Facilities for the Mentally Retarded. Usable data was provided by 68.1% of the institutions contacted. The extent of psychotropic drug use was considerable, 51% of the residents. However, no distinction was made between the number of residents who were actively receiving medication and those whose regimens had been terminated. Two major tranquilizers, thioridazine (Mellaril) and chlorpromazine (Thorazine), accounted for over half of all drug usage and were the preferred drugs in 91% of the institutions. Some of the reported maximum dosages were quite high, 3,000 mg/day for chlorpromazine and 1,800 mg/day for thioridazine, exceeding manufacturer recommendations. Even more disturbing was the length of treatment; 25% of the residents on medication typically received drug treatment for four or more years.

Recently, Sprague (1977) reported information about the extent and pattern of psychotropic and antiepileptic drug treatment from resident records in two midwestern residential facilities for the mentally retarded, one old and one new. The older institution was large with 1,639 residents housed in buildings with day rooms and open wards with beds. Residents ranged from mildly to profoundly retarded with a mean age of 27.4 years. The new facility housed 286 residents who lived in group homes designed for eight people. The entire facility was modeled after community living and from outward appearances looked much like a suburban housing division. Residents ranged from borderline to profoundly retarded with a mean age of 29.4 years. Despite differences in the philosophy and type of care represented by these two facilities, the prevalence of drug treatment was quite similar, 66% in the older large institution and 65% in the new community styled facility. Polypharmacy was common, 57% of the residents receiving more than one medication in the large facility and 59% in the small one. The three most frequently reported drugs in both institutions in rank order were thioridazine (Mellaril), pheyntoin (Dilantin), and phenobarbital.

In their massive survey of residential facilities for the mentally retarded in the Western United States, Payne, Johnson, and Abelson (1969) reported that 24% of all residents were receiving drugs for behavior problems. There was considerable variation in the prevalence of drug treatment across institutions ranging from 2% to 56%, with a median of 20%. The highest rates of drug use were reported in facilities serving primarily the profoundly retarded or the emotionally disturbed retarded.

Only two surveys about the extent, pattern, and purpose of drug treatment which included mentally retarded children in public schools have even been conducted (Gadow, 1976, 1977b). In 1975, Gadow (1977b)

surveyed teachers in noncategorical programs in early childhood special education in Illinois about psychotropic and antiepileptic drug treatment and interviewed the parents of children who received medication. The children served in these programs have developmental delays, handicaps, or learning problems ranging from mild to severe; however, data are not available on what percent are mentally retarded. Gadow reported that of the 2,559 children studied, 7.9% received medication for hyperactivity at some time during the school year. Many (45%) of the children had other handicapping conditions concomitant with hyperactivity, the most common being brain damage, mental retardation, and learning disability. By far the most frequently prescribed drugs were stimulants, primarily methylphenidate (Ritalin), which were administered to 71% of the hyperactive children. Excluding children being treated for both hyperactivity and convulsive disorders, parents reported polypharmacy for 10% of the children. In almost all cases, these additional drugs were administered in the evening to facilitate sleep. Generally the dosages were conservative, particularly the stimulants, but in some cases the reported dosages for thioridazine (Mellaril) were quite high.

The extent and pattern of drug treatment for convulsive disorders with the mentally retarded is even less well documented than for behavior problems. Anticonvulsant medication, particularly phenytoin (Dilantin), phenobarbital, primidone (Mysoline), and diazepam (Valium), are among the most frequently prescribed drugs in residential facilities (Sprague, 1977).

Payne, Johnson, and Abelson (1969) reported that 26% of all the mentally retarded persons in the institutions they surveyed were receiving drugs for seizure control. The prevalence for the 22 facilities ranged between 15% and 50% with a median of 27%. Institutions with the greater proportions of severe and profound residents also reported the most extensive use of drugs to control seizures with the highest, 46% and 50%, in two facilities exclusively for profoundly retarded bed patients. Seizure frequency across all residents was reported as follows: 12% had a history of seizures but none were observed, 7% had one or more seizure per month, and 12% less than one per month. The highest incidence of uncontrolled seizures were in the institutions which only served profoundly retarded bed patients. It is clear from these data that drug management of convulsive disorders is quite common and that uncontrolled seizures are also relatively frequent.

Gadow (1977b) reported, in the early childhood special education survey, that 6.6% of the children received medication for convulsive disorders at some time during the school year. Teachers described 75% of the children with convulsive disorders as having specific handicaps; the most common were mental retardation, brain damage, cerebral palsy, and hyperactivity. The most frequently prescribed drugs for the control of seizures were phenytoin (Dilantin), phenobarbital, primidone (Mysoline), and diazepam (Valium). Excluding children receiving medication for both hyperactivity and convulsive

disorders, 50% of the students receiving antiepileptic medication were administered two or more different drugs. The most common drug combinations were Dilantin and a barbiturate, Dilantin and Mysoline, and Mysoline and phenobarbital.

The Office of Mental Retardation Coordination (1972) reported on a comprehensive survey of the mentally retarded in public institutions, private facilities, and state mental hospitals conducted in 1969. A total of 255,000 mentally retarded children and adults were in residential facilities. Although these settings account for most of the severely and profoundly retarded, they are but a small part of the estimated 2 to 6 million retarded persons in the United States (Robinson & Robinson, 1976). Little is known about the extent and pattern of drug treatment with this population other than those in residential care. When one considers the legal, social, and educational issues and controversies surrounding drug treatment and mentally retarded children, this dearth of information is remarkable.

Role of the School in Drug Treatment

Were it just for the fact that psychotropic and antiepileptic drugs have a powerful effect on behavior and that these drugs are used extensively with children, particularly those in special education programs, drug treatment would be of interest to educators but perhaps only marginally. However, combined with the realization that the teacher can play a primary role in the management of children receiving medication and that the exclusion of the school from meaningful involvement seriously limits the effectiveness of drug treatment, this matter becomes one of considerable importance to educators.

The drug regimen can be conceptualized as consisting of three stages: diagnosis, dosage adjustment, and follow-up (Sprague & Gadow, 1976). Implicit in this trichotomy is the existence of a period prior to referral and diagnosis where caretakers cope with the child's behavior and attempt educational programming, and a period following the termination of drug treatment where other approaches are used to ameliorate learning and adjustment problems. The pre- and post-drug periods have generally been excluded from most scientific investigations although there is no shortage of discussion on this matter, particularly the events that lead to referral (Bosco & Robin, 1976). Although the psychosocial events leading to and including referral are certainly among the most controversial, this inquiry focuses primarily on the role of the school in the diagnostic, dosage adjustment, and follow-up stages of drug treatment.

A series of studies conducted at the Institute for Child Behavior and Development at the University of Illinois at Urbana-Champaign have demonstrated the importance of teacher participation in the treatment of hyperactive children with stimulant medication (Sprague & Sleator, 1973, 1975, 1976). By simply completing a brief behavioral rating

scale, teachers can provide the physician with valuable diagnostic information. In fact, in only unusual cases can the diagnosis of hyperactivity be made from behavior exhibited in the physician's office (Sleator & von Neumann, 1974). If a child is diagnosed hyperactive and the doctor decides to administer a trial dose of medication, the teacher can play an important role by evaluating the response to medication. The importance of teacher evaluations to the entire treatment program is forcefully conveyed in this following quote from Sleator and Sprague (in press):

> Remarkable sensitivity to drug effects on the part of the teacher has been replicated regularly in our laboratory. No other clinical measure even approaches this sensitivity and, in fact, we have found parents, on the average (although some parents are very sensitive), unable to distinguish even between on-drug and placebo periods. Teacher sensitivity, so clearly demonstrated by dose manipulation, indicates why we strongly recommend that monitoring of drug effects must include reports from the teacher if the physician hopes to effectively treat school children with learning and/or behavior disorders.

The teacher's involvement in the drug regimen is obviously more complicated than simply evaluating the efficacy of medication and reporting side effects. Because the child spends a considerable portion of his waking hours in the school, problems in learning, achievement, and adjustment also become a matter of concern for the teacher. Medication teaches the child nothing, and remediation of learning and developmental deficits must be an integral part of the entire treatment effort. The child's behavior problems also become a part of the dynamics of the entire class by affecting the behavior of other children and perhaps stifling the educational efforts of the teacher. It should come as no surprise that teachers involved in educational programming should be interested in treatment efforts concomitant with their own.

As with the extent and pattern of drug treatment with children, very little is known about the involvement of the school in the drug regimen. What data that is available comes from three sources (Bosco & Robin, 1976; Gadow, 1977b; Robin & Bosco, 1973; Weithorn & Ross, 1975; Gadow, Note 2), and the results of these surveys have been reviewed in depth elsewhere (Sprague & Gadow, 1976). Briefly, these studies have documented that there is very little direct communication between the doctor and the school, teachers feel they should be notified about drug treatment and the effects of the medication used, and the adequacy of current drug monitoring procedures is questionable. It is also noteworthy that even though teachers demonstrate a clear willingness to participate in the evaluation of the drug regimen (Gadow, 1977), they are poorly trained in the area of drug treatment,

have little in-depth knowledge about the effects of drugs, and much of what they do know comes from personal experience. A content analysis of the difficulties teachers encounter with children receiving psychotropic and antiepileptic drugs revealed five major problem areas: (1) the need for information about drug treatment, (2) improved communication between teacher, physician, and school, (3) guidelines for the involvement of school personnel in the drug regimen, (4) parent inconsistencies in administering medication, and (5) physician failure to adequately monitor drug treatment (Gadow, 1977b). There appears to be considerable disparity between what researchers and clinicians perceive as proper treatment procedures and typical practices in natural settings.

Objectives of the Study

In order to describe the extent of drug treatment with mentally retarded children in public schools and the involvement of teachers in the drug regimen, a study was designed to survey TMH teachers by mail about psychotropic and anticonvulsant drug use with the children they were teaching. The study was divided into two different phases plus a parent interview study to validate teacher reports. The objectives of Phase One were to: (1) determine the number of children who received medication during the school year and the reasons for which the drugs were prescribed, (2) characterize teacher experience with children receiving medication for learning, behavior, and convulsive disorders, (3) describe teacher training about drug therapy with children, and (4) identify problems teachers encountered with children receiving medication, their parents, and physicians. For Phase Two, teachers completed medication questionnaires for each child who received medication during the school year. The objectives of this phase were to: (1) describe teacher involvement in each stage of the drug regimen, (2) determine how drugs are administered and stored at school, and (3) identify problems teachers encountered with specific children receiving drug treatment. Telephone interviews were conducted with the parents of children who received medication to determine the accuracy of the drug information reported by the teachers. Although teachers were asked to evaluate the efficacy of treatment as well as side effects in Phase Two, this study is by no means a substitute for well-controlled laboratory research on drug effects. Rather, it is an investigation of how drug treatment is actually used with a large number of mentally retarded children under the management of a number of different teachers and physicians.

METHODOLOGY

The Rules and Regulations to Govern the Administration and Operation of Special Education (1976) specifies maximum initial enrollment in programs for the trainable mentally handicapped (TMH) should not exceed 10 students which may be increased to 12 pupils during the school year. If the TMH program has a full-time, noncertified assistant for the teacher, then enrollment can be increased by five students to a maximum of 15 children. Grouping the children by age is also specified as follows: early childhood (generally ages 3-5), primary (generally ages 6-8), intermediate (generally ages 9-11), junior high (generally ages 12-14), and secondary (generally ages 15-21). The age range within a special education program or instructional grouping is not to exceed 4 years.

Special education programs for the 1,030 operating school districts in Illinois are directed by 85 administrative units including the City of Chicago, which is one of the units. These administrative units are of two types, individual school districts, of which there are 20, and 65 joint agreements, i.e., a group of school districts in contractual agreement to provide special education services. Administrative units consisting of single school districts are typically located in larger urban centers and the joint agreements in suburban Chicago and thinly populated rural areas.

Obtaining Permission to Conduct the Study

Because the study would involve collecting drug therapy information about students and interviews with the parents of children who receive medication, a description of the study and request for approval was mailed to the State Superintendent of Public Instruction. The research proposal described the three phases of the study and procedures for protecting the confidentiality of student records and the rights of the children, parents, and teachers as research subjects. After the study was approved, the investigator proceeded with the next step in acquiring administrative approval to contact teachers and parents.

Prior to data collection, the appropriate administrator, usually the Director of Special Education, for each of the administrative units was contacted by telephone, and the nature and purpose of the study was explained. During the telephone conversation, the investigator emphasized participating teachers would receive a copy of the results, the study would be conducted directly with the teacher eliminating time demands upon administrators, and procedures protecting the confidentiality of school records would be strictly adhered to.

Nine of the administrative units did not have programs for TMH children, but services were provided by another unit through a contractual agreement. Of these nine, five are joint agreements serving rural areas. Two Directors of Special Education refused to participate, one did not want "to get messed up in that kind of thing," and

the other, fearing noncompliance because of recent union problems, did not want the questionnaires sent to the teachers. Both are joint agreements in rural Illinois. Together they had eight teachers and served 77 TMH children. The Director of Special Education for each of the remaining 77 administrative units was sent a package of materials describing the study. In the initial telephone conversation with the administrator, the investigator explained that he would call them back within a week after receipt of the materials to see if the study had been approved, and if so, acquire the names and school addresses of all the TMH teachers in that particular unit and the school nurse(s) assigned to the TMH children. The only departure from this procedure was for the city of Chicago. Upon the recommendation of a staff member employed by the Chicago Board of Education, the investigator first contacted the administrators of two large TMH centers whose students were representative of the racial, ethnic, and socio-economic distribution of the residents of the city. Each director was called and then mailed a package of materials.

When follow-up phone calls were made, the administrators of eight special education units (77 teachers and 767 TMH children) refused to participate in the study after receiving the introductory materials. The most common reasons for refusal were: (1) difficulties getting approval from school boards, (2) involved in other projects with TMH programs which were very time consuming, and (3) difficulty getting approval from local principals and superintendents. Unfortunately, for only two of these units were the teachers ever contacted directly about the study and asked if they would like to participate. Four units were technically excluded, two urban and two rural (28 teachers and 270 TMH children) because they failed to respond either way in time to conduct the survey. In none of these programs were teachers contacted directly about their willingness to participate. One unit agreed to participate but was unable to set up the study appropriately (four teachers and 38 TMH children), and another participated only partially because one of the superintendents involved in the joint agreement would not participate (three teachers and 17 TMH children). Excluding Chicago proper, there are 76 special education administrative units which have direct services for TMH children of which 60 (78.9%) actively participated in the study. Collectively, these units have 503 TMH teachers with class rosters, 76.1% of the total number of teachers, and provide services for 4,990 TMH children, 76.7% of the total number of TMH children. (Again, these figures exclude Chicago proper.) To contact all the administrators and their subordinates when appropriate and to make the necessary follow-up efforts required over 560 telephone calls.

Permission to contact the teachers and parents of TMH children for the two large Chicago TMH centers was granted by the building principals contingent upon approval from the main office. The offices of the appropriate administrators were contacted and the materials sent. Although numerous efforts were made to get a response to the proposal, none was obtained. Similar problems were encountered in a previous study (Gadow, 1976). A staff member who had administrative responsibilities for TMH programs in Chicago reported there were 150 TMH teachers in Chicago in programs serving 1,500 TMH children.

Procedure for Phase One

After acquiring the appropriate administrative approval, all teachers were mailed a package of materials which included the TMH Medication Questionnaire and a cover letter which explained the purpose of the study and the procedure for completing the survey materials. Also enclosed were a brief study proposal and the Children's Medication Chart (Gadow & Sprague, 1975) which is described in greater detail below. To encourage participation, a results coupon was provided for those teachers interested in receiving a report on the results of the study.

The TMH Medication Questionnaire is divided into five parts. Part I, Teaching Experience and Part II, Teaching Situation, concerns background information about teachers, their program and students. Information about drug treatment is recorded in Part III. Teachers are asked to list all children who received medication for convulsive disorders, hyperactivity, behavior problems, muscle relaxants for cerebral palsy, sleep problems, nervousness, etc., during the 1976-77 school year. Teachers list both children who received medication at home and/or at school. Children are identified by age, race, sex, name of the medication(s), the reason each drug is prescribed, and whether they are actively receiving medication at the time of the survey. (The child's name is never reported by the teacher.) To assist the teacher in correctly identifying the child's medication, a Medication List accompanies the questionnaire. The List contains 59 trade name products and three generic. Primarily trade names are used instead of generic names because most prescriptions are written by trade name (Silverman & Lee, 1974). The inclusion of products on the List was based on previous surveys of drug treatment (Gadow, 1976; Sprague, 1977; Sprague & Sleator, 1973; Gadow, Note 2) and discussions of clinical practice (Livingston, 1972). Medications that were neither psychotropic nor anticonvulsant were dropped from the study, and children who were reported as receiving medication but not from these two categories were also omitted from data analysis.

Part IV, Medication and Other Treatments, asks teachers how certain they are that they reported all children who received medication, how accurate they feel the drug data are, and how probable they feel it is that there are children in their class receiving medication of whom they are unaware. The means by which teachers are trained or acquired knowledge about specific areas of drug treatment are investigated in Part V. The last item on the questionnaire is an open-ended question which asks teachers to report what they feel are the major problems facing teachers when dealing with children on medication, their parents, and doctors.

Teachers were instructed to return the TMH Medication Questionnaire and results coupon by a specific date. A self-addressed, stamped envelope was enclosed. Teachers who did not return the questionnaire on time, within 2 weeks, were sent a reminder letter and a second complete package of materials excluding the Children's Medication Chart. Those teachers who did not respond within 2 weeks to the first reminder were sent a second reminder letter.

In an attempt to assist the teacher in reporting drug data, school nurses serving the TMH centers were mailed a package of materials prior to the Phase One mailing. The name of the school nurse was obtained from the administrator along with the names of the teachers. Information packages were sent to a total of 36 school nurses from 34 different special education administrative units. Of these, approximately one-half were full-time nurses serving large TMH centers in urban areas. The remaining nurses were routinely available to TMH staff for only a few hours per week. Many of the rural cooperatives reported that neither full-time nor part-time school nurses were available but the county or public health nurse was on call if an emergency arose.

Procedure for Phase Two

Teachers reporting children who received medication during the school year and who also returned survey materials by a specific deadline were sent Phase Two questionnaires. For Phase Two, each teacher received a cover letter explaining how to complete survey materials and a medication questionnaire for each child who received psychotropic or antiepileptic drugs at some time during the school year. In the same mailing, teachers also received materials to set up the parent interviews which included a parent permission letter complete with a cover letter from the teacher, stamped envelope for the permission letter, self-addressed, stamped envelope for the parent, and a Permission Letter Log. Each of these items are described below in greater detail.

Three different medication questionnaires were used in Phase Two: Teacher Medication Questionnaire: Convulsive Disorders, Teacher Medication Questionnaire: Behavior Problems, and Teacher Medication Questionnaire: General Disorders. One of these questionnaires was assigned to each child depending upon the reason for drug treatment provided by the teacher in Phase One. The General Disorders questionnaire was used for children who received medication for reasons other than behavior and convulsive disorders and children for whom the reason for medication was unknown. In order for the teacher to know which questionnaire was intended for each child receiving medication, the description of the child reported in Phase One including age, sex, race, drugs received, reason for medication, and whether or not the child was actively receiving drug therapy was written at the top of each questionnaire.

The three different medication questionnaires have a number of similar items. All have questions about teacher participation in the diagnosis, dosage adjustment, follow-up and termination of drug treatment. Specific questions concern the teacher's role in each of these aspects of drug treatment and with whom the teacher interacted. These questionnaires also collect data on how the teacher is informed about medication, side effects, attitude about dosage change, child's handicaps, drug-free periods, specific problems with that particular child

and medication, and information about medication administered at school, who gives it to the child, and how the drugs are stored.

Procedures for Mailing Parent Permission Letters

To protect the identity of the child and the confidentiality of his/her records, the teacher also addressed and mailed the permission letters to the parents as part of his/her Phase Two responsibilities. The permission letter explains that medication information is being collected about school children in Illinois and that the results of this study will be used, in part, to train teachers concerning the use of medication with children. Parents are asked to participate in a telephone interview with an interviewer at the University of Illinois at Urbana-Champaign. The letter also states that participation in the study is completely voluntary, and that no names will be used in data analysis, only code numbers. A cover letter, signed by the teacher, was stapled to the parent permission letter. The cover letter explains that the school is participating in the study and that permission letters are being mailed by the school to parents of children who receive medication. To participate, parents completed the permission letter to include name, address, telephone number, time of day they preferred to be called, and signature and mailed it to the investigator in a self-addressed, stamped envelope.

Whether or not the permission letter was mailed to the parent was at the discretion of the child's teacher. If for any reason the teacher felt the letter should not be sent, e.g., no telephone in the house, the subject of medication was too "sensitive," etc., the letter was returned to the investigator. Information about the distribution of the permission letters was recorded in a Permission Letter Log. The Log is a record of whether or not the letters were mailed, and if not, the reason for not sending them to the parent.

Teachers were instructed to return the medication questionnaires, unused parent permission letters, and Permission Letter Log by a specific date. If the materials were not returned within 2 weeks of the date they were mailed, teachers were sent a reminder letter. A second set of reminder letters were also mailed to nonresponders.

No parent or child names were used on survey materials or in the recording and analyzing of the data. Teacher and parent names were only used in addressing envelopes.

Procedure for Parent Interviews

Within 2 weeks of receipt of the completed permission letter, each parent was mailed an introductory letter and the Children's Medication Chart. The letter states that an interviewer will call the parent within 2 weeks to ask questions about their child's medication. Parents are instructed to see if the medication their child received during the school

year is pictured in the Chart, and to be prepared to report their child's weight. A self-addressed envelope was enclosed.

The Children's Medication Chart consists of life-size, color reproductions of 31 different trade name products and one generic in various dosages and forms for a total of 69 different capsules and tablets. The inclusion of drugs in the Chart was based, in part, on previous surveys (Sprague & Sleator, 1973; Gadow, Note 2) and from descriptions of clinical practice (Livingston, 1972). Dosage forms considered appropriate for most children were slected from dosage and schedule information in the Physicians' Desk Reference (1975).

Parents or legal guardians who returned permission letters were interviewed. Interviewers were instructed to interview the mother of the child, and, if this were not possible, the primary caretaker. At the onset, the interviewer read a prepared statement describing who she was and the purpose of the call. Next, the parent was asked to locate the Children's Medication Chart and identify the medication(s) their child was receiving, or, if drug therapy had been terminated, the last medication(s) the child received when drug therapy was terminated. The exact identity of the drug by dosage and form was recorded by having the parent identify the drug by its number in the Chart. For medications not pictured, interviewers obtained a description of the drug including name, color, form, identification marks, and dosage if known. Using this same procedure, other drugs the child had received during the school year were also recorded and identified. At the close of the interview, the interviewer read a prepared statement thanking the mother for participating in the study.

The two interviewers were trained on how to use the Children's Medication Chart as well as the childhood disorders for which each drug was prescribed. Because of experience gained in another study involving parent interviews about drug treatment with preschool children (Gadow, 1977a), both interviewers were considered quite capable and competent in collecting this type of data from parents.

In order to collect as much data as possible for an entire school year, the study was conducted close to the end of the school year.

RESULTS

TMH Medication Questionnaires were mailed to 383 teachers of which 333 (86.9%) were returned. Three were from a team-teaching situation, and, to prevent duplication of data, only one was used in data analysis. One questionnaire was returned blank and another was received too late to be included in the study, leaving a total of 329 usable questionnaires. The return rate for the initial mailing is 53.5%, for the first reminder 56.7%, and the second reminder 33.8%. The three groups do not differ significantly in terms of the number of teachers who reported children receiving medication or the actual percent of children who received drug treatment during the school year.

In Phase One, 275 (83.6%) TMH teachers reported a total of 597 children who received drug treatment at some time during the school year. Because of late responses to Phase One, the number of teachers available for participation in Phase Two was reduced to 245, and the number of children was reduced to 539. Teacher participation in Phase Two is as equally great as Phase One; 85.7% returned Phase Two questionnaires for 461 (85.5%) children. The return rate for the first Phase Two mailing is 81.4%, the second 35.1%, and the third 27.1%. There is no significant difference in the relative frequency of return for the different types of medication questionnaires.

Of the 210 teachers participating in Phase Two, eight were excluded from mailing parent permission letters because their response to Phase One was too late in the year to permit adequate time to send reminder letters to the parents. Therefore, they received only the teacher medication questionnaires in Phase Two. If the remaining 202 teachers participating in Phase Two mailed all their parent permission letters, then the parents of 464 children receiving medication were contacted about participating in telephone interviews. Whether or not permission letters were mailed was recorded in the Permission Letter Log. Logs were returned for all but 10 of the 202 teachers participating in Phase Two. Of the 10, only two teachers did not have any parents who returned permission letters. From comments listed on the Logs, teachers decided not to send letters to 38 (8.2%) of the parents. The major reasons for not mailing letters were no telephone in the home (11), child or family had moved (13), parent not intellectually capable (6), and other (8).

The parents of 211 children returned permission letters consenting to a telephone interview. However, 12 could not be interviewed because there was no phone in the home or the number was unlisted (7), parent moved out of state (1), mother spoke only Spanish (1), child had not been on medication during the most recent school year (2), and parents recently divorced (1). A liberal calculation of the return rate using only those parents who received letters as the base sample is 49.5%. If the parents who were not sent letters because of teacher preference are included, the return rate would be 45.5%. The percent of letters returned by disorder is as follows: convulsive disorders (51.8%), behavior disorders (54.5%), convulsive-behavior disorders (65.5%),

and general disorders (22.8%). Permission letters were returned for at least one child in 143 (70.8%) different classrooms.

Description of TMH Programs, Teachers, and Children

Almost all of the classes meet for a full day, and most teachers report the assistance of an aide. Half-day classes are primarily for preschool children aged 3 to 5 years. Only 6.5% of the teachers said their students are mainstreamed for any part of the day. Most of the classes are housed in a TMH Center, and only 61 teachers report that there are nonspecial education classes in the same facility that houses the TMH classrooms. The number of students per teacher ranges from 3 to 31, with a median of 9.5 students per teacher. Of the 26 classes with 15 or more students, all but three are for students aged 15 to 21 years.

Many teachers (62.2%) typically interact with parents on a weekly or monthly basis. Of the 320 teachers indicating a specific rate, the frequency of teacher-parent contact is as follows: at least once a week (66), at least once a month (133), at least once every four months (105), and at least once a year (16).

Most of the teachers are between 21 and 30 years old and have a bachelor's degree; a little less than a fourth have an advanced degree. Most (74.4%) of the teachers taught in TMH programs for six years or less, but only 50 (15.2%) taught TMH children for one year or less.

A total of 3,306 children are reportedly receiving educational services in TMH programs, or, if no longer in attendance, were in school for at least four months. More males (57%) than females (43%) are enrolled in TMH programs, and the distribution by race is as follows: White (86.[illegible]%), Black (10.6%), Latins (2.3%), and other (0.8%). The different age groups are distributed relatively equally with the exception of early childhood classes which account for only a small portion of the total sample. Teachers identified 933 (3.5%) children as being Down's syndrome.

Teacher Training and Experience

Most teachers reported teaching experience with children receiving medication. Of the three disorders (hyperactivity, behavior problems, and convulsive disorders), experience with the latter is the most common. Only nine teachers had no experience with children receiving medication for either hyperactivity or convulsive disorders, and 37 (11.2%) reported no encounters with children on medication for hyperactivity or behavior problems. Teachers also report experience giving medication at school and managing seizures in the classroom. Only 99 (33.1%) of the teachers have never given medication to a child for either convulsive or behavior disorders,

and over half (55.6%) have direct experience with a child who had a grand mal seizure in the classroom.

Teachers receive little formal training about drug treatment for behavior problems and convulsive disorders. Training about seizures, managing seizures in the classroom, and use of medication for behavior problems is received by some teachers in college, but information about specific drugs is acquired primarily from personal experience. This is also true for role behaviors as well. Inservice training is the least cited source of information. Many teachers (44.1%) did not receive college training on managing grand mal seizures in the classroom or the classmates of a child having a seizure. Of the 183 teachers reporting experience with grand mal seizures in the classroom, 83 indicated they had no college training on how to manage seizures, and 109 no college training on how to handle the peers of a child with uncontrolled seizures. The percent of teachers who have no college training about the most frequently prescribed psychotropic and antiepileptic drugs for children is also quite high: Mysoline (89.6%), Mellaril (89.7%), Phenobarbital (77.8%), Dilantin (76.9%), and Ritalin (72.5%).

Prevalence and Pattern of Drug Treatment

During the school year, 275 (83.6%) teachers encountered at least one child in their classroom who received psychotropic or anticonvulsant drugs, and 95 (28.9%) teachers had three or more children receiving medication. Including children receiving drug treatment for both convulsive and behavior disorders, 212 (64.4%) teachers reported children on medication for convulsive disorders, and 139 (42.2%) reported children on medication for behavior disorders. A total of 597 children, 18.1% of the entire sample, reportedly received psychotropic or antiepileptic drugs at some time during the school year. Excluding the 54 teachers reporting no children on medication, the percent of children receiving medication per classroom situation ranges from 5% to 100%.

The primary reasons for which drugs are prescribed and the prevalence of drug treated disorders in the total sample is presented in Table 1. Adding in the children treated for both convulsive and behavior disorders, the prevalence of drug treatment for behavior problems is 6.7% and 11.9% for convulsive disorders. Eleven of the children treated for behavior disorders (BD) and 18 of the children treated for convulsive disorders (CD) are treated for other disorders as well. For the latter, the most frequent secondary disorders are cerebral palsy (8) and anxiety (5), and for behavior disordered children, the major (7) secondary reason for medication is the control of side effects produced by the major tranquilizers. The distribution of both primary and secondary disorders among children receiving medication is presented in Table 2.

Because the collecting of diagnostic data was beyond the scope and the purpose of the study, the term behavior disorders is being used to denote children with several different types of disorders. From the reasons for drug treatment reported by teachers, the 161

children receiving medication for behavior disorders can be grouped as follows: hyperactive (88), behavior problems (23), hyperactive-behavior problems (12), aggressive (14), psychotic behavior (7), attention deficits (4), and 13 unknown. The latter are designated as behavior disorders from the medication prescribed and the reasons for which the drugs are used with other TMH children. The other reasons for which drugs are prescribed are self-explanatory.

Comparing children on medication to children off medication, the two groups are not significantly different in terms of sex or age; however, there are significantly fewer Blacks (12.86%) than Whites (18.40%) reportedly receiving medication ($\chi^2 = 6.36$, $df = 1$, $p < .02$). Of the total smaple, a significantly greater number of males than females are treated with drugs for behavior disorders ($\chi^2 = 8.71$, $df = 1$, $p < .01$), but a significantly greater number of females are treated for convulsive disorders ($\chi^2 = 9.37$, df, 1, $p < .01$). This is also the case when convulsive disordered and convulsive-behavior disordered children are combined ($\chi^2 = 4.79$, $df = 1$, $p < .05$). Although age differences are not significant, there is a definite trend in the data for both behavior disordered and convulsive-behavior disordered children. There is a higher percentage of children receiving psychotropic drugs during the ages of 9 to 14 compared to children with convulsive disorders, particularly ages 12 to 14. The prevalence of drug treatment for convulsive disorders in the total sample by age group is as follows: ages 3 to 5 (12.4%), ages 6 to 8 (10.5%), ages 9 to 11 (10.3%), ages 12 to 14 (8.9%), ages 15 to 17 (10.3%), and ages 18 to 21 (10.1%). With the exception of preschool children, the prevalence across age groups is remarkably similar. The prevalence of drug treatment for behavior disorders shows greater fluctuations with a very low frequency for the preschool years and a higher frequency for children between the ages of 9 to 14. The actual figures are as follows: ages 3 to 5 (0.5%), ages 6 to 8 (4.1%), ages 9 to 11 (6.7%), ages 12 to 14 (6.5%), ages 15 to 17 (3.7%), and ages 18 to 21 (4.6%).

Almost half (45.4%) of the children received more than one different drug during the school year, and an equal number were administered drugs in combination. Also, over half (54.3%) of the convulsive disordered children are administered more than one different drug per day but only 13.1% of the children with behavior disorders ($\chi^2 = 56.5$, $df = 1$, $p < .001$).

Only a few (3.7%) of the children treated for convulsive disorders were no longer on medication when surveyed compared to 13.4% of the behavior disordered children. This difference is significant ($\chi^2 = 13.07$, $df = 1$, $p < .001$) as is the difference between these two groups in terms of the number of children already receiving medication at the beginning of the school year with a greater number of convulsive disordered children enrolled already on medication ($\chi^2 = 14.52$, $df = 1$, $p < .001$). (Teachers are certain that 85.9% of the behavior disordered children and 95.9% of the convulsive disordered children were already receiving medication when enrolled in school.)

A total of 1,004 drugs were reportedly administered to 597 TMH children at some time during the school year (see Table 3). The percent of the total drug volume by drug category is as follows: anticonvulsants (43.0%), hypnotics and sedatives (20.7%), stimulants (12.3%), major tranquilizers (8.7%), minor tranquilizers (6.5%), and antidepressants (1.0%). In rank order, the six most frequently prescribed drugs are Dilantin, phenobarbital, Ritalin, Mysoline, Mellaril, and Valium. Collectively, these drugs account for 68.8% of the total number of reported drugs. The percent of children in the total sample receiving each of these drugs is as follows: Dilantin (6.87%), phenobarbital (6.17%), Ritalin (2.72%), Mysoline (2.21%), Mellaril (1.54%), and Valium (1.39%), Although most drugs are reported by either trade name or generic name, the identity of 38 (3.8%) drugs is unknown. However, the reason for which these drugs are prescribed is unreported for only nine.

Medication reportedly used in the management of convulsive disorders is presented in Table 4. Dilantin and phenobarbital account for 61.9% of the total number of drugs.

Stimulants account for 44.8% and major tranquilizers 33.8% of the total number of drugs used in the management of behavior disorders (see Table 5). Among the children receiving drugs for behavior disorders, 33.8% received Ritalin at some time during the school year and 24.8% received Mellaril.

The frequency of drugs administered to children receiving medication for <u>both</u> convulsive and behavior disorders is presented in Table 6. During the school year, Dilantin was administered to 63.3% of the children, phenobarbital to 38.3%, Ritalin to 35.0%, and Mellaril to 10%. Stimulants account for 51.7% and major tranquilizers 25.0% of the total number of drugs reportedly used for the control of behavior disorders.

There are seven other disorders for which psychotropic drugs are administered. For each of the disorders listed below, the number in parentheses following the drug name indicates the reported frequency. The three drugs administered for cerebral palsy are Valium (10), Dantrim (6), and phenobarbital (2). Artane (3) and Cogentin (4) are antiparkinsonian agents used to control the side effects produced by major tranquilizers. A number of different drugs are reportedly used for the control of anxiety: phenobarbital (5), Valium (4), Librium (2), Mellaril (2), Donnatol (2), and Periactin (1). Diamox (2) is reported as a diuretic, and Tofranil (7) for the treatment of enuresis and bladder problems. For sleep problems, teachers report Benadryl (1), Phenergan (1), Meprospan (1), and Valium (1).

Opinions about Referral

A relatively large number of teachers (30.0%) have children in their class whom they feel should be checked by a doctor to see if drug treatment would be appropriate. A total of 124 children, 3.75%

of the total sample, are in need of such an evaluation according to teachers. A smaller number of teachers (6.4%) feel they have a child who should be referred for a medical evaluation regarding the necessity of drug treatment and the management of a possible convulsive disorder. Twenty-four children, 0.73% of the total sample, are in need of such an evaluation according to TMH teachers. Some teachers (6.4%) also feel that children in their TMH classes (20) could be placed in classes for the educable mentally handicapped if placed on medication to control behavior disorders. A number of teachers (16.0%) feel they have children in their class receiving medication for hyperactivity or behavior problems who should be taken off drug treatment. According to teachers, 17 children, 8.5% of the children reported as receiving medication for behavior disorders, should not be receiving medication. There are also parent refusals of school recommendations for a medical evaluation about the advisability of drug treatment for behavior problems and hyperactivity. During the school year, 42 teachers (12.8%) report such experiences involving the parents of 46 children, 1.39% of the total sample.

General Problems with Drug Treatment

When asked to list the problems they frequently encountered with children receiving medication, 264 (80.2%) teachers reported a total of 615 specific problems. The number of problems per teacher is as follows: zero (65), one (97), two (86), three (53), four (19), five (5), and six (4). There are no significant differences between teachers who report problems with children receiving medication and those who do not in terms of experience with children and medication, program characteristics, or perceived accuracy of drug information.

Problems encountered by teachers were sorted into eight areas: communication, participation, information, choice of treatment, role expectations, drug regimen, giving medication at school and other (see Table 7). Although there is an obvious overlap in these groupings, especially communication, participation, and information, sorting was done according to the following criteria. Problems categorized as communication deal with a lack of interaction and are further subdivided into communication problems between teacher-doctor, parent-doctor, teacher-parent, and parent-teacher-doctor. If a specific bit of information is desired but not provided, the problem is grouped under information which is subdivided into situations in which parent, teacher, or doctor are not informed about some aspect of drug treatment. If the people involved are specified, e.g., the parent does not tell the teacher the child is receiving medication, the problems are sorted according to the appropriate interaction, doctor does not inform teacher, parent does not inform teacher, and doctor does not inform parent. Participation describes situations in which a specific input is desired, or, if offered, is not responded to appropriately. The choice of treatment category deals with concerns about the treatment modality selected, desire for a different

therapeutic approach, reluctance to try medication, etc., and the conflicts that arise in differences in opinions about what is best for the child. Problems categorized under role expectations concern teacher perceptions of the inability of the key figures in drug treatment to fulfill role expectations. They fall primarily into two groups: (1) perceptions of what parents should not do, and (2) perceptions of what doctors should do. The problem area identified as drug regimen has to do with the mechanics of drug treatment to include diagnosis, dosage adjustment, and follow-up. Typical problems concern side effects, proper dosage, rebound effects, etc. Because many teachers are required to give medication at school, a number of problems involve this act. The last category, other, contains problems difficult to place elsewhere, e.g., liability of the teacher for harm resulting from a seizure at school.

The need for information is by far the largest problem area, and the teacher's need for information the largest subdivision. Specific problems listed under the latter include information about the reason why the drug is prescribed and its effect on behavior (28) and need for more teacher training and about medication (17). Other problems include the need to be informed of changes in the drug regimen (7), about side effects (5), and the loss of information when parents are used as informants (5). Teachers also feel parents are poorly informed about the drugs, their effects, and even why they are prescribed. Teachers would prefer more information from doctors about the drug regimen (11), drug effects (5), and changes in the regimen (3). Another problem is the parents failure to tell teachers about the use of medication at home (13), or changes in the drug regimen (6).

The second largest problem area is role expectations. Teachers perceive physician failure to meet role expectations as a major problem primarily in the form of poor follow-up and monitoring procedures (15). Other frequently stated problems are lack of knowledge about TMH children (9) and poor diagnostic procedures (4). Parent failure to meet role expectations consists primarily of noncompliance, i.e., adjusting dosage on their own initiative without physician approval (10), inconsistent or irregular administration (35), and not sending medicine to school on time (9). Other problems include wanting the child over-medicated (6) and terminating treatment on their own initiative.

The drug regimen itself presents a number of problems for teachers as well. One area, evaluating the effect of the drug, poses problems in terms of finding a more scientific method for assessing drug effects (7), the need to reevaluate drug regimens (10), trying to differentiate the child's natural behavior from drug effect (2), and trying to determine if medication helps the child (6). Other large problem areas

are over-medicated students (14), side effects incompatible with school objectives (11), side effects (8), finding an effective drug (10), and finding the proper dosage (7).

For the remaining problem areas, a few specific problems in each area account for most of the responses. Under communication, the most frequently cited problems are the quality, or lack, of communication between the teacher and doctor and the problems coordinating interaction between teacher, doctor, and parent. Although this category excludes designations for specific information, five responses concern communication problems in regard to the evaluation of drug effectiveness. The major problem identified under participation is teacher exclusion as a team member in certain aspects of the treatment regimen, specifically evaluating or re-evaluating the effect of the drug on the child's behavior (19), during diagnosis (5), or in the termination of treatment (4). A variety of different situations are grouped under choice of treatment with the most frequent being parent reluctance to try medication (14) and beliefs that certain children should not be medicated (3). The major problems with giving medication at school are concerns about liability (10) and remembering to give the medication (6).

Teacher Participation in the Drug Regimen for Consulsive Disorders

Teacher involvement in different aspects of the drug regimen for children being treated for convulsive disorders is presented in Table 8. According to teachers, only six of the 241 children receiving drugs for convulsive disorders were definitely enrolled in school off medication and were placed on drug treatment at some time during the school year. For five other children, teachers are uncertain if the child started school on medication. Regardless of the reason for communication, teachers intereact primarily with the child's parent or the school nurse in matters involving the anticonvulsant drug regimen. Information about what the seizure would be like is typically provided by the parent while both parents and the school nurse are the key informants and how to manage the child's seizures. For both of these items, a number of teachers indicate they already knew what to expect and what to do. There is a relative increase in interaction with the physician when it comes to reporting the effects of medication and describing seizures. However, as with the other items, involvement in the drug regimen is typically through the parent.

Teachers indicate that 41.4% of the children receiving medication for convulsive disorders have seizures at school (see Table 9). Of these children, 76.6% had a seizure within a month or less prior to the teacher's completion of the questionnaire. Records of seizures at school

are kept by teachers for a little more than half of these children, but teachers indicate they report seizure occurrence to someone for 95% of the children. Children having seizures at school differ from children whose seizures are controlled in a number of ways. A significantly greater number of children with uncontrolled seizures receive more than one different drug per day ($\chi^2 = 7.03$, $df = 1$, $p < .01$), have more side effects ($\chi^2 = 16.44$, $df = 1$, $p < .001$, are more apt to have dosage changes ($\chi^2 = 29.61$, $df = 1$, $p < .00001$), and are more apt to have another handicapping condition concomitant with convulsive disorder ($\chi^2 = 6.87$, $df = 1$, $p < .01$). Of the 98 children having seizures at school, the frequency of occurrence ranged from daily (26), weekly (25), monthly (20), to only a few times per year (27). Many (64.2%) of the teachers indicate they know the type of seizure the child is having, or if completely controlled, the type of seizure the child was having before medication successfully controlled them. By far the most common seizure type is grand mal with petit mal listed second. Mixed or more than one seizure type in combination are reported for 26.2% of the children about whom seizure information is known.

Teachers are involved in the drug regimen to a significantly greater degree for children who have seizures at school. Compared to children whose seizures are completely controlled, at least at school, for a significantly greater number of children with uncontrolled seizures teachers report being informed in advance of what the seizures would be like ($\chi^2 = 9.55$, $df = 1$, $p < .01$), how to manage the seizures ($\chi^2 = 18.62$, $df = 1$, $p < .00001$), report the effect of medication on the child's behavior ($\chi^2 = 10.80$, $df = 1$, $p < .001$), and report side effects of drug treatment ($\chi^2 = 14.00$, $df = 1$, $p < .001$). Although involvement in the drug regimen for children with uncontrolled seizures may be expected, it is interesting to note that for the teachers of these children, 42% were not told in advance what the seizures would be like, and 34% were not told how to manage the seizures. Of the 98 children having seizures at school, teachers report the occurrence of seizures to someone for 93 of the children. Describing seizures to assist the physician in diagnosis is reported for 53 of the children with uncontrolled seizures.

Teacher comparisons between specific children on medication for convulsive disorders and their classmates on five variables are presented in Table 10. Over a third of the children on medication are considered more drowsy than their classmates.

Teacher Participation in the Drug Regimen for Behavior Disorders

Of the 118 receiving medication for behavior disorders, teachers identify with certainty only 14 (11.9%) who were placed on drug treatment

during the school year (see Table 11). For these 14, participation is limited with only seven teachers making referrals for medical evaluation and only four providing behavioral evaluations prior to the onset of drug treatment. Teacher suggestions that the child might benefit from a medical evaluation are made only to parents, and suggestions that the child might benefit from drug treatment are made only to school staff members, primarily the school psychologist. For only eight children did teachers either suggest the desirability of a medical evaluation or the possibility of medication as treatment strategy. Teachers made behavioral evaluations to assist the doctor in diagnosis for only four of the 14 children placed on medication during the school year. The recipients of these evaluations are as follows: parent (3), doctor (3), and school nurse (1).

Teacher participation in the evaluation of the effect of the medication on the child's behavior is presented in Table 12. Although teachers made evaluations for 60% of the children, for only 11 (9.5%) children was a behavior rating scale used. It is interesting to note that there are no significant differences between those children who are placed on medication during the school year and those children who enter school already receiving medication and teacher participation in any of these four evaluative activities. The primary person with whom the teacher interacts about the effect of medication on the child's behavior is the parent. For only nine (7.6%) of the 118 children receiving drugs for behavior problems did teachers report the effect of drug treatment directly to the physician, and for only 3 (2.5%) was a behavioral rating scale used.

Teacher evaluations of therapeutic benefit from drug treatment for children both on and off medication when surveyed are presented in Table 13. It is interesting to note that for 36% of the children on medication, teachers did not feel there is definite therapeutic benefit from medication. Conversely, of the children no longer receiving medication, a few are perceived as being helped by medication, and for many, teachers are simply uncertain.

Those teachers who felt medication helped the child were asked to list specific behavioral changes they perceived as beneficial (see Table 14). Changes in activity level and improvements in attention are the most frequently cited areas of improvement.

Of the 93 children on medication at the time of the survey, seven (7.5%) were taken off medication at some time during the school year, and of the 24 either off medication or status unknown, teachers are certain that 16 were taken off medication during the school year (see Table 15). Less than half of the teachers participated in the termination of medication, but for five children, teachers indicated they were instrumental in getting drug treatment stopped. Drug-free periods to assess the continued need for treatment were scheduled for 22 (18.8%) of the children at some time during the school year. Of these, 10 are no longer on medication.

Comparisons between Convulsive and Behavior Disorders

The principal source of teacher information are parents, school records and the school nurse. School records, for the most part, are completed by the parents. Although medical evaluations should be a part of the child's school file, drug information is typically reported by the parent. Teachers rely more heavily on the school nurse for the name of the medication. When asked if they think the information about medication in the child's record is accurate and up-to-date, teachers say "no" for 14.3% and "uncertain" for 10.5% of the convulsive disordered children and "no" for 20.0% and "uncertain" for 13.0% of the behavior disordered children. For only 73% of all the children receiving medication for behavior and convulsive disorders are teachers certain that the drug information in the school records is accurate.

Many teachers (22.3%) report no contact with the parent about medication and 92.1% no contact with the child's physician (see Table 16). No contact with the parents of children treated for convulsive disorders (26.3%) is almost twice as great as for the parents of behavior disordered children (14.4%). This difference is significant ($\chi^2 = 7.31$, $df = 1$, $p < .01$). Three or more parent contacts about medication are reported for 35% of the convulsive disordered children and 41% of the children being treated for behavior disorders.

Teachers are certain of changes in the dosage of medication for 30% of the children receiving medication for behavior and convulsive disorders. A change in dosage is reported for a significantly greater number of children treated for behavior disorders (37%) than for convulsive disorders (26%) ($\chi^2 = 4.94$, $df = 1$, $p < .05$). When asked if they think the dosage should be changed, teachers desire changes for 11 (5.1%) of the children actively receiving medication for convulsive disorders and 17 (18.1%) of the children actively receiving medication for behavior disorders.

Teachers observed side effects of drug treatment in 30% of the children, but for only 26% were teachers informed of what to look for in terms of untoward reactions (see Table 17). Of the children whom teachers feel experienced side effects of medication, they were informed of what to expect in terms of side effects for only some of the children. The percent by disorder is as follows: behavior disorders (39%), convulsive disorders (38%), and behavior-convulsive disorders (14%). The primary sources of information are the child's parent or the school nurse. For only a few children (13) did the physician tell the teacher what side effects to look for or expect.

Administration of Medication at School

Over half of the children receiving drug treatment take medication while they are at school (see Table 18). A significantly greater number of children receiving medication for behavior problems compared

to children treated for convulsive disorders take medication while in school ($\chi^2 = 9.98$, $df = 1$, $p < .01$). The child's teacher is in charge of administering the medication for 48% of the children, and 11% of the children are responsible for their own medication. Self administration of medication is reported for 17% of the children treated for convulsive disorders and 4% of the children with behavior problems. Although for most children a school staff member supervises the taking of medication at school, medication is actually handed to a lesser number (76%) of children. Teachers are certain there are no written instructions from the doctor about how the drug should be administered (dosage and schedule) for a fourth of the children and no daily record of administration is kept for half of the children. The figures are less for children whom teachers indicate are actually handed their medication by a school staff member. For these children, there are no written instructions from the doctor for 19.5%, no permission letter from the parent for 8.2%, and no daily record for 55.3%.

Teachers also provide information about how medication is stored at school. Medication is kept in a locked container for 141 (67.8%) children, stored unlocked for 44 (21.2%), unspecified for 10 (4.8%) and carried to school by 13 (6.3%) children. Medication is stored unlocked for 19% of the children who have medication handed to them, and locked for almost half of the children teachers indicate are not handed medication. A wide variety of places are cited as storage containers for medication to include the teacher's desk, purse, file cabinet, etc., as well as the nurse's office or a medicine cabinet. The most common places are in some type of cabinet, nurse's room, and desk.

Problems with Specific Children and Drug Therapy

Teachers report at least one problem with medication or the management of the drug regimen for 61 (52%) of the children treated for behavior disorders and 81 (34%) of the children treated for convulsive disorders. A significantly greater number of problems are reported for the behavior disordered children ($\chi^2 = 10.34$, $df = 1$, $p < .01$). The most prominent problem areas with anticonvulsant drug treatment are the lack of information, parent failure to meet role expectations, and the drug regimen (see Table 19). Teachers report they are inadequately informed about the use of medication, effects of the drugs, or changes in the drug regimen, e.g., schedule, dosage, and drug type. Inconsistency in the administration of medication is the major complaint under parent role expectations as well as the need for a reevaluation of the dosage, schedule, etc. The major problems with the drug regimen are side effects incompatible with classroom objectives (28) and overmedication (3), difficulty differentiating between the effects of the drug and the child's behavior (9), drug failure (9), and need to have the regimen reevaluated (7).

drugs the child receives during the school year, is on the conservative side. However, for 138 (75.8%) of the TMH children, teacher and parent drug reports are identical!

Equally impressive is the small number of errors made by the teachers in reporting the reasons for which the drugs are prescribed. Of the 322 drugs in both teacher questionnaires and parent interviews, there is a mismatch in the reason for use for only 6 (0.2%) of the drugs. All six cases involve children on medication for both convulsive and another disorder. As with identifying reason for treatment, there are only a few errors in teacher designations as to whether or not the child is still receiving the medication and whether or not use of the drug had been stopped.

Teachers, report failure to meet role expectations, conflicts, over the choice of treatment, and certain drug effects as the major problem areas with children being treated for behavior disorders. Problems with the choice of treatment center primarily on disagreements between parents and teachers as to whether or not the child should be receiving medication or whether or not to raise or lower the dosage. As with the management of children with convulsive disorders, teachers see parent irregularities in the administration of medication as the primary example of parent failure to do what teachers feel they should. The major problems listed under the drug regimen category are side effects incompatible with school objectives (13) and overmedication (2), drug failure (10), fluctuations in behavior as a result of changes in serum level (5), tolerance for therapeutic response (3), and evaluating the efficacy of treatment (6). Exclusion from decision making in the use and evaluation of medication is cited by seven teachers under participation. Difficulties surrounding the evaluation of the effect of the medication on the child's performance is frequently cited by teachers as a major problem and, as a problem category, is listed under several of the major areas.

Teachers have problems with drug treatment with a significantly greater number of children who are placed on drug treatment during the school year than with those who entered school already receiving medication for behavior disorders ($\chi^2 = 4.60$, $df = 1$, $p < .05$). With the exception of one variable, there are no significant relationships between involvement in the anticonvulsant drug regimen and reported problems. Although there are no significant differences between teachers with parent contacts and problems, a greater number of teachers reporting direct contacts with the doctor had problems with drug therapy ($\chi^2 = 6.87$, $df = 1$, $p < .01$).

Accuracy of Teacher Drug Reports

Interviews were conducted with the parents of 199 TMH children who received medication at sometime during the school year. In order to determine the accuracy of the drug data reported by the teachers, the information from the parent interviews was compared to the medication reports in the Phase Two teacher medication questionnaires. Of the 199 interviews, teacher-parent comparisons are possible for 182. From the 182 parent-teacher pairs, teachers report a total of 322 drugs, and, when compared to parent reports, only three drugs are misidentified. This means that teachers misidentified only 0.9% of the drugs they indicated their children took during the school year.

Parents did report 43 drugs that the teachers did not. For the most part, these errors of omission can also be explained. Most of these drugs are not given during the day (19), initiated or stopped during the school year (12), used for a short duration (3), etc. Several errors can be traced to the fact teachers knew the school records were not up-to-date. Regardless of the reason for omissions, it is clear that the total drug volume, i.e., the number of different

drugs the child receives during the school year, is on the conservative side. However, for 138 (75.8%) of the TMH children, teacher and parent drug reports are identical!

Equally impressive is the small number of errors made by the teachers in reporting the reasons for which the drugs are prescribed. Of the 322 drugs in both teacher questionnaires and parent interviews, there is a mismatch in the reason for use for only 6 (0.2%) of the drugs. All six cases involve children on medication for both convulsive and another disorder. As with identifying reason for treatment, there are only a few errors in teacher designations as to whether or not the child is still receiving the medication and whether or not use of the drug had been stopped.

DISCUSSION

Considering that teachers with children receiving medication, which was most of the sample, were asked to complete an eight-page questionnaire in Phase One, complete a four-page medication questionnaire for each child on medication in Phase Two, and mail permission letters and reminder letters to the parents of children receiving drug treatment, the degree of teacher participation in this study was considerable. The return rate for the questionnaires in both Phase One and Phase Two is approximately 86%, and over 70% of the teachers had at least one parent of a child receiving medication return a permission letter agreeing to a telephone interview. Although parent participation was appreciably less than for the TMH teachers, the return rate for permission letters is quite similar to another study using the same procedure (Gadow, 1977a). Participation at the state level was also encouraging with over three-fourths of all special education administrative units agreeing to let teachers respond to survey materials.

The only disappointing aspect of the procedure to acquire permission to contact teachers was the exclusion of teachers in the decision-making process at several special education administrative units and the reluctance of a few Boards of Education to permit research. Considering the return rates for the questionnaires, it is probable that many teachers who would have liked to participate in the study were prevented from doing so. Because there was an information-sharing procedure built into the study, many teachers would benefit from the experience. Feedback from previous studies have supported this assumption (Gadow, 1977b). It is ironic, therefore, that the unsubstantiated concerns about possible litigation voiced by school board members may actually hinder improvements in the delivery of services to the very children whose rights they are delegated to protect. It is also questionnable whether research review procedures which exclude teacher input are in the best interest of TMH children. It must be reiterated, however, that the extent of administrative approval to conduct the study was gratifying considering the fact that the survey involved interviews with parents about a topic some may feel is "sensitive." Although the investigator has encountered this concern elsewhere, parents are quite open to discussion about drug treatment, and many are quite eager to talk to an interested person about it (Gadow, 1977a).

In terms of program characteristics, TMH programs, for the most part, conform to state guidelines. Class size is limited; most teachers have an aide; and the age distribution within each class approximates state standards. Almost all the children are served in TMH centers with only 6.5% of the teachers indicating their students were mainstreamed for <u>any</u> part of the school day.

Exposure to children receiving medication for behavior and convulsive disorders as well as with children who have seizures in the classroom is almost a universal experience for TMH teachers.

During the 1976-77 school year, 84% of the teachers reported at least one child who received medication, and 30% had three or more students receiving psychotropic or anticonvulsant drugs. These data compare favorably to early childhood special education programs where 81% of the teachers taught children on medication for behavior and convulsive disorders during a specific school year (Gadow, 1976). Keeping in mind that the median class size for TMH programs is 9.5 students, the percent of children receiving medication per teacher ranged from 5% to 100% with a median of 19.5%. It is clear from these data that teachers not only have experience teaching children who receive medication, but encounter such children on a daily basis.

In view of this familiarity with children on medication, it is interesting to note how poorly prepared teachers are to handle such a situation in any meaningful way. Not only do large numbers of TMH teachers receive no training about drug treatment with children, but little of what they do know comes from college instruction or in-service training. The primary source of information about the most frequently prescribed psychotropic and antiepileptic drugs is from personal experience. Only a little more than half of the teachers who had managed a child having a grand mal seizure in the classroom received college training about what to do. Other studies have also documented the lack of teacher preparation for working with children receiving medication and are reviewed elsewhere (Sprague & Gadow, 1976).

Prevalence and Pattern of Drug Treatment

The prevalence of reported psychotropic and antiepileptic drug treatment in programs for TMH children is 18.1%. This is considerably less than 50% to 60% prevalence rates reported in residential facilities for the mentally retarded (Payne, Johnson, & Abelson, 1969; Sprague, 1977). Because the available data are so limited, comparisons to other special education programs cannot be made with the exception of early childhood special education (Gadow, 1977b). (Gadow used almost identical procedures to acquire data about preschool special education children and studied children in the same state the TMH data were collected.) The prevalence of psychotropic and antiepileptic drug treatment in early childhood special education programs was 13.9%, significantly less than in the TMH classes ($\chi^2 = 17.70$, $df = 1$, $p < .001$). Although this may not seem surprising, considering the fact that TMH children as a group are more severely mentally retarded than children in noncategorical early childhood special education, there are some unexpected differences between the two in terms of specific disorders. Excluding children treated for both behavior and convulsive disorders, 10.0% of the TMH children and 5.5% of the preschool-aged children were administered medication for convulsive disorders, a significant difference ($\chi^2 = 25.94$, $df = 1$, $p < .001$). However, a significantly greater proportion of preschool-aged children received drugs for behavior disorders than TMH children ($\chi^2 = 10.06$, $df = 1$, $p < .01$). (The actual prevalence figures are 6.8% for

early childhood special education and 4.9% for children in TMH classrooms.) Even the prevalence rates for 3- 5-year-old (0.5%) and 6- 9-year-old (4.5%) TMH children are lower than those for early childhood special education. The greater prevalence of drug treatment for convulsive disorders among TMH children would be expected because there is a direct relationship between severity of impairment of cognitive function and the prevalence of convulsive disorders. However, why there should be more children in early childhood special education programs on drug treatment for behavior management is unclear. As a means of comparison, the most recent figures on the prevalence of drug treatment for hyperactivity in elementary schools is 2.12% (Safer, Note 3). Including children receiving medication for both behavior and convulsive disorders, a little more than three times as many TMH children are on medication for behavior disorders than elementary school children. However, compared to the figures for residential facilities for the mentally retarded, this seems very low.

The most frequently prescribed drugs in rank order are phenytoin (Dilantin), phenobarbital, methylphenidate (Ritalin), primidone (Mysoline), thioridazine (Mellaril), and diazepam (Valium). Dilantin, phenobarbital, and Mysoline are used primarily as anticonvulsants, and in only a few cases were these drugs cited as being used for behavior disorders. Although the efficacy of these drugs in the management of behavior disorders is questionable, it is possible that some types of behavioral disturbances, aside from psychomotor seizures, may respond to antiepileptic drugs and, therefore, be considered a type of convulsive disorder (Schain, Note 1). Ritalin and Mellaril are used primarily for the management of behavior disorders. By far the most frequently stated behavioral characteristic for which these two drugs are prescribed is hyperactivity. Valium is used for several different disorders according to teachers. In rank order they are convulsive disorders, cerebral palsy, behavior disorders, and anxiety. A total of 48 different drug products were reported by TMH teachers with anticonvulsant drugs including phenobarbital accounting for well over half of the total drug volume.

Drugs for convulsive disorders. Dilantin, phenobarbital, and Mysoline are the three most frequently prescribed drugs for the management of convulsive disorders with TMH children. Similar results are reported for children treated for convulsive disorders in early childhood special education programs (Gadow, 1976). Two drugs recently added to the list of available antiepileptic agents, carbamazepine (Tegretol) and clonazepam (Clonopin), were reported with some frequency. Because the different types of convulsive disorders respond most favorably to different antiepileptic drugs (Livingston, 1972), the frequency with which some drugs are used reflects the prevalence of the convulsive disorders. For example, grand mal seizures are by far the most common type of convulsive disorder with a prevalence rate around 80% of all people with epilepsy (Epilepsy Foundation of America, 1975). The most favored agents used to control grand mal seizures are phenobarbital, Dilantin, and Mysoline. True petit mal seizures are

much less common with a prevalence rate between 6% and 12% of children with convulsive disorders. The favored agents in the management of petit mal seizures are the succinimides (Zarontin, Celontin, and Milontin) and the oxazolidinediones (Tridione and Paradione) (Livingston, 1972). Minor motor seizures (myoclonic and akinetic), frequently associated with mental retardation, are often refactory to existing therapies (Livingston, 1972). Valium and Clonopin may be used in combination with other anticonvulsants in an attempt to control seizures. Livingston has been a strong advocate for the use of the ketogenic diet for young children with myoclonic seizures. He has also found that Tegretol, Mysoline, and phenobarbital are the most effective drugs in the control of psychomotor seizures. Although it would have been interesting to find out the types of drugs used for the different kinds of seizures, collecting diagnostic data was clearly beyond the scope of this study.

Drugs for behavior disorders. Stimulants and major tranquilizers were the most frequently prescribed drugs for the management of behavior disorders in TMH children. As a group, stimulants accounted for 45% of the total number of psychotropic drugs. Ritalin, administered to 42% of the children treated for behavior disorders during the school year, was the "drug of choice." The efficacy of stimulant drugs in the management of hyperactivity and behavior problems has been clearly established particularly in terms of improvement in attending abilities and the suppression of behavior problems (Ross & Ross, 1976; Safer & Allen, 1976). Of the stimulants, Ritalin is considered the "drug of first choice" because it produces the fewest side effects. Surveys of nonretarded hyperactive school children (Krager & Safer, 1974) and children in early childhood special education (Gadow, 1976) show Ritalin to be the most frequently prescribed drug for hyperactivity. Magnesium pemoline (Cylert), approved by the FDA in 1974 for the management of behavior disorders, was the second most frequently reported stimulant.

The major tranquilizers accounted for 34% of the total psychotropic drug volume with Mellaril administered to 25% of the TMH children at some time during the school year. The efficacy of major tranquilizers in the suppression of undesirable behaviors has been clearly established, but, because adaptive behaviors are also affected, long-term treatment poses some challenging therapeutic questions (Marholin & Phillips, 1976). The phenothiazines, e.g., Mellaril and Thorazine, may also impair cognitive performance and learning particularly at higher dosages (Hartlage, 1965). The possibility of impairing intellectual abilities with drug treatment in children who are already mentally retarded presents the therapist, school, and family with some difficult decisions. It should be noted that not all children who are hyperactive should be so classified because hyperactivity may be concomitant with much more severe forms of behavioral disturbance, particularly among mentally retarded children (Fish, 1971). Such children may not respond at all to stimulant drugs. It is also possible for a child diagnosed as hyperactive not to respond to stimulants and other drugs may have to be employed (Katz, Saraf, Gittelman-Klein, & Klein, 1975).

Also, there are some children who do not react satisfacotrily to drug treatment at all, at least the types of drugs that are presently being used. Regardless, the effect of drug treatment on the child's ability to learn and perform in the classroom should be a fundamental concern of caretakers for both intellectually normal and mentally retarded children. Although this appears transparent, statements in the literature by experts in the area of pediatric psychopharmacology do not always give this impression as exemplified in the following quote from Millichap (1969):

> In the hyperactive mentally retarded child drugs are used primarily to facilitate management. In the child of normal intelligence it is important that the drug should have no untoward effects on learning, and the control of motor hyperactivity should be accompanied by improvement in attention, memory, perception, and coordination. (p. 1241)

Children treated for both convulsive and behaivor disorders. It is not uncommon for behavior disorders to be concomitant with convulsive disorders, and vivid descriptions of the problems such children present to their families are available (Ounsted, 1955). Approximately 1.8% of the TMH sample were receiving drugs for both disorders which compares favorably to the 1.1% figure for children in early childhood special education programs (Gadow, 1976). The higher rate for TMH programs is expected considering the prevalance of drug treatment for convulsive disorders is considerably higher. The rank order of the three most frequently prescribed drugs for convulsive disorders is identical to that of the convulsive disordered children who are not being treated for behavior disorders. Although the percentage receving phenobarbital in the latter is higher by 12%, this difference is not significant. Because motor restlessness (hyperactivity) is a relatively common side effect of phenobarbital, it is generally contraindicated for convulsive disordered children with behavior problems (Livingston, 1972).

The drugs prescribed for the management of behavior disorders in children also treated for convulsive disorders are quite similar to those used with behavior disordered children. Ritalin is the preferred agent, but it is noteworthy from the standpoint of possible drug interactions that a variety of drugs are used. Because stimulant drugs may be used to control certain types of seizures and to counteract drowsiness produced by some anticonvulsant drugs, e.g., phenobarbital (Livingston, 1972), it is difficult to say why a particular stimulant is being used unless the teacher actually knew the reason. None of the teachers reported stimulants being used to control drowsiness, but from personal conversations the investigator has had with a number of neurologists, this is in all probability not an accurate picture of stimulant drug use. This has considerable intuitive appeal when one considers that 37% of the children on medication for convulsive disorders are considered by their teachers to be more drowsy or sleepy than their peers!

Differences between convulsive and behavior disorders. Aside from the specific drugs prescribed, there are several differences in the status and pattern of drug treatment between behavior and convulsive disorders. Polypharmacy, the use of more than one drug in a treatment regimen, was reported for 45% of the children actually on medication when the teachers were surveyed. This figure is only a little less than those reported by Sprague (1977) for two residential facilities for mentally retarded, 57% and 59%. The contrast between the management of behavior and convulsive disorders and the use of multiple drugs is striking, 53% for the convulsive disordered children and 13% for the children treated for behavior disorders. Similar differences are reported for children in early childhood special education programs (Gadow, 1977b). Although it is customary to prescribe only one drug at a time for the control of behavior disorders, additional drugs are sometimes used to help induce sleep, or to control side effects produced by the major tranquilizers (Katz et al., 1975; Winsberg, Yepes, & Bialer, 1976). Convulsive disorders, on the other hand, may not respond satisfactorily to one agent, and it is not unusual for multiple drugs to be used though the efficacy of more than three agents is questionable (Livingston, 1972).

The two disorders also differ in terms of the number of children both placed on and taken off medication during the school year. About four times as many children treated for behavior disorders are placed on and taken off medication during the school year as children on anticonvulsant drug regimens. It is possible to calculate the incidence, the number of new cases per period of time, of drug treatment for both convulsive and behavior disorders. Using the school year as the yardstick, the incidence rate of drug treatment for convulsive disorders is 3.9 per 1,000. After reviewing several studies, the Epilepsy Foundation of America (1975) reports an incidence rate of 0.2 per 1,000 for the general population per year. However, the figure for children ranges from 0.35 - 0.55 per 1,000. The incidence rate of drug treatment for behavior disorders is 6.3 per 1,000. Both figures are potentially conservative because a child could be placed on medication without the teacher's knowledge. This would be less probable in the case of convulsive disorders because drug treatment would be preceded by uncontrolled seizures in almost all cases. What is striking is the low incidence figure for behavior disorders. Allegations that drug treatment for behavior problems is administered in a capricious manner and that large numbers of children are being placed in chemical straight jackets often at the urging of the school would lead one to believe that many more children would have been placed on medication (Divoky, 1973). And, if the decision to use drugs as a treatment modality was a function of school pressure, certainly the teacher would know the child was placed on medication during the school year. Therefore, "known" incidence is not an underestimate from the standpoint of possible school involvement. What is eye opening is that the investigator had to survey the State of Illinois to find a sample large enough--3,306 TMH children, to identify 21 children placed on medication for behavior disorders during the school year!

Accuracy of teacher medication reports. Medication reports from TMH teachers are quite accurate and are a valid means of collecting drug data about school children. This has been demonstrated with another groups of teachers as well (Gadow, 1976). This does not imply that all teachers have up-to-date drug treatment information at their finger tips, but rather, when asked to gather and report such data, they can do so efficiently and accurately. Comparing teacher and parent drug reports for specific children shows that teachers misidentified less than 1% of the total drug volume. One may question whether or not parent reports are a good standard against which to compare drug information from teachers. Previous research has shown that the name of the drug is typically on the bottle, and the Children's Medication Chart is a comprehensive representation of the frequently prescribed drugs for children (Gadow, 1977b). It is a simple matter to match their child's medication to the picture and name of the drug in the Chart. Comparisons between teacher and parent reports show that for about 20% of the children teacher statements of total drug use are on the conservative side. Drugs prescribed for a short duration, only at bedtime, stopped or started during the school year, and not administered during the school day are sometimes omitted from teacher reports. Therefore, figures for the total drug volume for the school year, which is considerable, and for some children the total number of drugs received, are conservative estimates.

Considering the source of drug information, one might ask to what degree have all the children who received psychotropic or anticonvulsant drugs during the school year been reported? Although alternative data sources were not investigated to determine the accuracy of prevalence rates, there is indirect evidence that underreporting is limited. First, most teachers feel quite certain they know which of their students receive medication for behavior and convulsive disorders and consider it improbable that there are children on medication of whom they are unaware. Although this may be challenged as an attempt not to appear ignorant, teacher confidence in the accuracy of their drug information certainly seems warranted. Second, the school has a considerable degree of familiarity with the child and the family. Because most of the children are taught TMH centers, the child spends most or all of his/her schooling in the same facility. Third, most teachers indicate they typically interact with the parents of their students on a weekly or monthly basis. For 80% of the children receiving medication, teachers talked with the child's parent specifically about medication. Finally, considering the severity of the TMH child's problems, parents may be much less inclined to conceal drug use. This, combined with the fact the child may have other medical problems concomitant with mental retardation certainly mitigates motives to conceal deviance.

The significance of unreported prevalence is, of course, dependent upon the question or problem that is being posed. For example, if an argument is being made for the need to train TMH teachers about drug treatment because of the extent of drug use,

"true" prevalence may have some importance. However, if drug treatment is already pervasive as is the case in TMH programs, then the fact that known prevalence is a conservative estimate has little significance. It only means the severity of the problem may be even greater.

School Involvement in the Drug Regimen for Behavior Disorder

It is frequently stated that children treated for hyperactivity are referred to physicians by the school (Safer & Allen, 1976). Because certain school situations, e.g., teacher-directed tasks requiring sustained attention, make the disorder quite detectable, it is not unexpected that the school informs others of children who have behavior problems that warrant special attention. The teacher is not only able to compare the hyperactive child's behavior to the performance of his peers, but has ample opportunity to do so considering the amount of time each child spends in school. Also, the hyperactive child may be unresponsive to conventional teaching strategies as evidenced by poor achievement (Wender, 1971), and his disruptive behavior may make classroom management quite difficult for the teacher. For these and other reasons, the role of the school in the referral process is not only understandable but should be encouraged (Sprague & Gadow, 1976). Some of the concerns expressed by clinicians and educators about this role for school personnel is overreferral, making medical diagnoses, suggesting the child be placed on medication, and pressuring parents into choosing drug treatment as the best solution to the child's problems (Ladd, 1970; Schrag & Divoky, 1975). Others have alleged these abuses by caretakers occur quite frequently (Divoky, 1973). As already stated, however, the incidence of drug treatment for behavior disorders among children in TMH programs is very low. For none of the TMH children placed on medication during the school year did teachers tell the parent the child might benefit from drug treatment. When such suggestions were made, they were given to fellow staff members. For seven children teachers did suggest to parents that their child should be examined by a doctor. These data are consistent with other research on the involvement of the school in the referral process which also failed to support claims of gross misconduct by school teachers (Gadow, 1977b).

Of equal concern as the child who should not be placed on medication are children whose treatment needs go unattended. TMH teachers reported 124 children whom they felt should be referred for a medical examination to see if drug treatment would help control behavior disorders. Perhaps of even greater interest are the parents of 46 children with behavior disorders who refused to act on school referrals for a medical evaluation. It would be important to know what happens to these children, why the parents failed to act on the referral, and what the actual interactions between school and family were. Interviews with parents of children receiving medication for hyperactivity have failed to document the pressuring of parents into drug treatment by

school personnel (Gadow, 1977a). Due to methodological problems, however, this allegation may be supported on a case-by-case basis (Truck, 1976), but actual prevalence figures may be impossible to determine (Gadow, 1977b).

For reasons already discussed, the teacher is in an excellent position to evaluate the behavior of children. It is often difficult for the physician to diagnose hyperactivity, certainly the severity of the disorder, from the child's behavior in the doctor's office (Sleator & von Neumann, 1974). In order to get an appreciation of the child's problems, the doctor must rely on the reports of caretakers. The more people asked to provide evaluations the fewer the risks of misdiagnosing the disorder or underestimating situation-specific characteristics. For example, the child's problems may be manifest primarily when interacting with the mother but not a problem at school. Because of the importance of teacher input in the diagnostic process, a simple ten-item behavioral rating scale, the Conners' Abbreviated Teacher Rating Scale, has been developed for teachers to complete and return to the physician (Sleator & von Neumann, 1974). This is the most widely used device to diagnose hyperactivity and evaluate the effects of drug treatment. A score of 15, two standard deviations above the mean, serves as a convenient cutoff point when screening children for hyperactivity. Although the importance of teacher involvement in the diagnosis of hyperactivity is clearly established, for only four of the 13 TMH children placed on medication was this procedure followed. For three children teachers intereacted directly with the doctor and the fourth through the school nurse. It is possible that another school staff member could have made evaluations of the child's behavior and report them to the doctor without the teacher's knowledge. This, however, would seem to defeat the purpose of school input in the first place. The number of children known to be placed on drug treatment during the school year is small and equally limited is teacher involvement in the diagnostic process.

Once the decision to administer medication for a trial period has been made, the dosage is typically increased over a period of time until a desired therapeutic response is achieved. Using the Conners' Abbreviated Teacher Rating Scale, teachers have proven to be remarkably sensitive to the behavioral effects of subtle changes in dosage of stimulant drugs on hyperactive children (Sleator & von Neumann, 1974). By requesting these ratings from teachers, the physician can determine what the optimal dose should be, as well as gather information about side effects. Dosage adjustment, however, is not limited to the onset of treatment. Dosage may be changed when the child develops a tolerance for the therapeutic response, develops side effects, or when the child is being switched from one drug to another. Over a third of the children treated for behavior disorders had a change in dosage during the school year and at least 15% a change in the type of drug prescribed. During the school year, teachers suggested the dosage should be changed for a third of the children treated for behavior disorders. They were

certain changes were made for 60% of these children, and felt changes were still necessary for 17 of the 94 on medication when surveyed. If response to the initial drug trial and dosage adjustment is satisfactory, the child will have to be monitored closely to ensure adequate care.

The follow-up phase of drug treatment includes monitoring the effect of medication on the child's behavior to include scheduling drug-free periods or breaks in medication to assess the continued need for treatment (Sleator & von Neumann, 1974). Ideally these activities are directed by the child's physician. As in diagnosis and dosage adjustment, the teacher can provide the doctor with evaluations of the child's behavior. Changes in the child's response to medication as well as the appearance of side effects are examples of information that could be shared with the doctor. Although there is considerable research and clinical support for the efficacy of teacher involvement in the follow-up phase of treatment (Sprague & Gadow, 1976), the realities of the situation fall far short of the expectations in the literature. Teachers evaluated the effect of medication for only 60% of the TMH children, and for only 10% was any type of behavioral rating scale used. Teachers suggested dosage changes for a third of the children and reported side effects of medication for 40%. These figures for the degree of involvement in the drug regimen are almost identical to those reported for 114 children in early childhood special education programs treated for hyperactivity (Gadow, 1977b). On one hand, it is clear that teachers are involved in drug treatment whether they are asked or not, but on the other, there is almost no use of standard forms to evaluate drug effects and for many children, teachers do not play any evaluative role at all. What is most disquieting is the fact that the level of involvement is not significantly different for children who are placed on drug treatment during the school year compared to those who are already on medication when enrolled. One might expect from previous studies that although follow-up procedures are less than adequate (Sprague & Gadow, 1976), the decision to place a child on medication would involve the school to a greater degree. Such is not the case.

A number of researchers and clinicians have argued that drug-free periods to assess the continued need for treatment are an important part of follow-up procedures (Arnold, 1973; Sleator & Sprague, in press; Sprague & Gadow, 1976). However, for only 22 of the 118 children treated for behavior disorders were such breaks in medication scheduled during the school year. This is almost half the rate reported for hyperactive children in early childhood special education (Gadow, 1977b). Interestingly, although few TMH children were scheduled breaks in medication to assess the continued need for treatment, over half of the children had been observed off medication by their teachers. Because children may spend a number of years in the same TMH center, there would be many opportunities to observe a child off medication unless treatment was continuous from the time of initial enrollment.

Teachers felt approximately two-thirds of the children benefited from medication. The specific change correlating the highest with feelings of general therapeutic benefit was reduction of hyperactivity. Having an opportunity to observe the child off medication had a big effect on teacher perceptions of the effectiveness of drug treatment. Teachers see a much larger percent of children on medication as benefiting from drug treatment if they have seen the child off medication. Uncertainty about drug efficacy is greatly inflated if the teacher does not have an opportunity to observe the child off medication.

Very little has been reported in the literature about how best to go about the termination of drug treatment (Sprague & Gadow, 1976). Even less is available on what happens in everyday practice (Gadow, 1977b). With short acting drugs such as stimulants, treatment can be abruptly stopped at any time with few effects other than the reappearance of the behavior disorders. Some have argued that if possible the child should be taken off medication during weekends, holidays, and summer vacations (Sleator & Sprague, in press). Such a schedule would hold the child's exposure to drugs to a minimum. By having the child start school off medication, the need to reinstitute drug treatment is established on a yearly basis. However, for some children with severe behavior problems this may not only be impractical but detrimental to therapeutic progress (Katz et al., 1975). About 13% of the children who received drugs for behavior disorders were no longer on medication near the end of the school year. Teachers participated in the termination of treatment for less than half. Similar results were reported for children in early childhood special education (Gadow, 1977b). Teachers perceived the parent as the primary initiator of the idea to stop medication, but teachers played an active role for five children.

The primary source of teacher information about the use and name of medication is the child's parents. This may come in the form of personal conversations or school forms completed at enrollment. Also, it is with parents that teachers become involved in the drug regimen regardless of the reason for interaction. It is to parents they make suggestions about the desirability of medical examinations, dosage changes, and even the termination of treatment. Although other school personnel may be involved, the parent is the key person. With the exception of a few cases, there is no direct contact whatsoever with the child's physician. This comes as no surprise and has been documented in several other studies (Gadow, 1977b; Sprague & Gadow, 1976). For only 11 of the 118 children treated for behavior disorders, was there any direct contact between teacher and doctor. Clinicians have argued that a minimal criteria for parent-doctor contact during the follow-up phase is two contacts within the last 6 months or three contacts per year (Arnold, 1973; Solomons, 1973). Others have made a strong case for much more frequent interaction (Sleator & von Neumann, 1974). Because there is so little contact between teacher and doctor, one might hope that school performance would be discussed by parent and doctor during office visits. It is encouraging to see that for 41% of the children, teachers had three or more conversations with parents about medication during the school year. But for 45% of the students

there are only one or two conversations per year about medication and for 14% none at all. Even if one accepts the notion of the parent as the conveyor of information to the doctor, the parent appears to be a somewhat limited data source. Studies of the frequency of parent-doctor interaction indicate the opportunities for exchanging information are also limited (Gadow, 1977a; Solomons, 1973). Not only are behavioral rating scales rarely used to assess drug effects, but the channels of communication are extremely limited.

It is possible that information about the child's performance at school is given to parents and doctors without the teacher's knowledge by another school staff member, e.g., the school nurse. These data, then, would be conservative estimates of school involvement. However, one may question the accuracy and usefulness of school reports that do not involve any teacher input because they would be so far removed from the teaching setting itself. Similarly the use of the parent as the conveyor of information about school performance may also be challenged. This procedure raised concerns by TMH teachers as well as others (Gadow, 1977b) that the doctor might not get an accurate picture of school performance. It is possible that teachers are not interested in being involved in drug treatment at all, or, if involved, prefer to interact primarily with other staff members, e.g., the school nurse. Other research on special education teachers in Illinois shows a very strong attitudinal commitment to involvement in drug treatment, and most prefer to interact with the child's doctor in regard to receiving information about possible drug effects, reporting evaluations of the efficacy of treatment, and suggesting the termination of medication (Gadow, 1976).

Clinicians have long argued the importance of active school involvement in the drug regimen for behavior disorders (Arnold, 1973; Conners, 1973; Eisenberg, 1972), and data-based models such as the one developed at the Institute for Child Behavior and Development at the University of Illinois have clearly demonstrated the usefulness of this role (Sleator & von Neumann, 1974; Sleator & Sprague, in press; Sprague & Sleator, 1973, 1975, 1976). Unfortunately, these data about TMH children show a striking disparity between what is considered to be adequate standards for service delivery and what actually happens in everyday practice. Although the teacher should be an active member of the treatment team, such is not the case. If involved, her role consists of sharing annecdotal information with parents and other school staff members. It would have been naive, however, to expect the results of this study would show an interdisciplinary approach to drug treatment. Walking into almost any school and engaging teachers in conversations about drug treatment would corroborate these results. The importance of this problem is stated in the following quote by Sleator and Sprague (in press):

> [The doctor] must be in active communication with the child's teacher. The physician would not consider treating anemia, for example, without repeated laboratory tests. For the child with learning problems the teacher is the physician's clinical

> laboratory, and yet most doctors are treating such children without essential feedback that will reveal efficacy of treatment. In our experience, most teachers are eager to share information with the doctor. If a change is to be effected, the medical profession must play an active role in setting up convenient communication channels between the doctor and the school.

The above is obviously directed at clinicians, but most teachers need little encouragement to participate in a meaningful way. By definition the exceptional child is placed in a setting in which environmental manipulations are made to ameliorate learning problems and facilitate development. Therefore, it should come as no surprise that teachers are interested in treatment efforts concomitant with their own.

School Involvement in the Drug Regimen for Convulsive Disorders

Although there are numerous statements by clinicians, advocacy agencies, and educators about the importance of teacher involvement in the antiepileptic drug regimen (Crowther, 1967; Epilepsy Foundation of America 1975; Goldin et al., 1971; Livingston, 1972), there are no data-based models for school involvement per se. Even so, it is possible to construct a model similar to the one developed at the University of Illinois for the treatment of hyperactive children. Schools may refer children suspected of having a convulsive disorder and this may be quite important in the case of nonconvulsive types, e.g., petit mal and psychomotor (Livingston, 1972). TMH teachers reported 24 children whom they felt should have been referred because of a possible convulsive disorder. For only 13 of 321 children receiving antiepileptic drugs were teachers certain the child was placed on medication during the school year. Unmfortunately, more detailed information about the referral process was not collected. Because the physician may not actually be in a position to observe the child's seizures, the teacher may be able to provide useful diagnostic data by describing the nature of the seizure. If the diagnosis confirms the existence of a convulsive disorder, the child will typically be treated with antiepileptic drugs.

While the dosage is being adjusted, the teacher can serve in a facilitating capacity by reporting side effects, particularly those that impair school performance, as well as the frequency of seizures at school (Livingston, 1972). This involvement in dosage adjustment is not limited to the onset of treatment. For example, as the child grows with resulting changes in body weight, the amount of medication may have to be increased. Teachers were certain of dosage changes for 27% of the children treated for convulsive disorders. If the termination of medication is being considered, teacher reports of the occurrence of seizures are also very important. Reporting seizures at school regardless of the situation may be quite significant. For children whose seizures were previously controlled, the reoccurrence

of the disorder may signal changes in blood serum level which have resulted from failure to give medication regularly or, as mentioned, physical changes in the child's body (Kutt, 1974). Such seizures could also be the sign of a progressive neurological disorder. Uncontrolled seizures at school, particularly grand mal, brings the teacher into active involvement with the disorder itself which can also affect the functioning of the classroom as well.

For less than half of the children receiving drug treatment for convulsive disorders were their teachers told what the child's seizures would be like, or how to manage them if they did have one at school. For the latter, nonconvulsive seizures pose few problems, but at least 65% of the TMH children had grand mal seizures. This may seem to be of little significance for the child who tolerates medication well and whose seizures are completely controlled. But of the children who had seizures at school, which was 41% of the sample treated for convulsive disorders, teachers were not informed of what the seizures would be like à priori for 42% nor were they instructed on how to manage the child's seizures for 34%. Many teachers cite parents as informats about what to expect if the child has a seizure at school, but the school nurse also plays an important role in disseminating information about what to do. (A number of teachers said they already knew how to manage seizures.) When children do have seizures at school, most teachers notify someone, usually the parent and/or school nurse, and for one-half of the children teachers keep a seizure record. For over half the children with uncontrolled seizures, teachers said they described what the seizures were like to assist the physician. Although these descriptions were conveyed to parents and/or school nurses, some teachers had direct contact with the child's doctor. Many teachers also commented to parents and school nurses about the effect of the medication on the child.

As with children treated for convulsive disorders, the source of much information about drug treatment as well as the principal persons with whom the teacher interacts about the drug regimen are the child's parents. Teachers rely more on school records for medication information about children treated for convulsive disorders than for behavior disorders. Also, teachers are less apt to talk with parents of children treated for convulsive disorders. However, for most children there was at least some parent-teacher interaction about medication. As might be predicted from the data about children with behavior disorders, direct contact with the doctor was negligible. For some aspects of anti-epileptic drug treatment interaction with the school nurse was frequent. She provided information about side effects, seizure management, and what to expect if the child had a seizure. The school nurse was also the recipient of teacher reports of drug effects and seizures,

Because the amount of medication necessary to completely control seizures may also produce side effects, difficult decisions may have to be made about the benefits of drug treatment versus untoward reactions. This is particularly true when medication actually impairs the child's ability to learn or perform in the classroom. Some have argued that if such is the case, it may be better for the child to have a few uncontrolled seizures than go through life in a state of confusion (Crowther, 1967; Livingston, 1972). Obviously, there is no right

solution to such problems, but school input may be helpful in reaching a decision. Drowsiness is a common side effect of both phenobarbital and Mysoline, two of the three most frequently prescribed anticonvulsants (Livingston, 1972; Stores, 1975). When teachers were asked to compare children receiving anticonvulsants to other children in the class, 37% of the children on medication were characterized as more drowsy or sleepy than the other children in the class! What is significant about this figure is that 36% of the children on antiepileptic drugs in early childhood special education programs were also described as sleepy or drowsy (Gadow, 1977b). Also, a survey conducted by the National Epilepsy League (Pietsch, 1977) reported drowsiness as a side effect for 35% of the children in their survey. Although most people develop a tolerance for drowsiness within 2 weeks after the onset of treatment (Stores, 1975), it is clear from these data that for many the problem persists to some degree. For teachers it would be reassuring to know what are drug effects and what characteristics are part of the child's natural temperment. Those involved in the plight of the epileptic have long been concerned about the child with petit mal seizures mistaken and harassed as a daydreamer. But it would also be important to know how many children made drowsy by these drugs are also inappropriately badgered because of their inattentiveness.

Administration of Medication at School

Perhaps one of the more interesting aspects of these data are the procedures followed for administering medication at school. Over half, 55% of the children who receive drug treatment for behavior and/or convulsive disorders take medication during the school day. The necessity for medication during the day has much to do with the relationship between the pharmacokinetics (absorption, distribution, biotransformation, and excretion) of most antiepileptic and psychotropic drugs and therapeutic response. Arguments have been for divided daily dosages in the management of most convulsive disorders because this produces a more even blood serum level (Svensmark & Buchthal, 1964). Although researchers have clearly demonstrated the efficacy of one daily dose of stimulant medication for the control of hyperactivity (Sleator & von Neumann, 1974), research about everyday practices clearly shows a preference for divided daily dosages for stimulants and other psychotropic drugs used in the management of behavior disorders (Gadow, 1977b). Time-release capsules are available for some drugs, e.g., dextroamphetamine (Dexedrine Spansules) and phenytoin (EKKO), but research shows these drug forms are used infrequently (Gadow, 1977a). Due to the low prevalence of moderate and severe mental retardation in the general population, many TMH children are bussed to educational programs. Because it would be impractical to bus children home at noon just to take a pill, many of these children must take their medication during school hours. This situation is not peculiar to TMH programs. Krager and Safer (1974) reported that 61% of the children receiving medication for hyperactivity are administered medication at school.

Contrary to what might be expected, classroom teachers and teacher aides supervise (administer) the taking of medication at school; only a little more than a third are supervised by a school nurse. This is also true for other special education programs in Illinois (Gadow, 1977b). Even though many teachers may prefer to have the school nurse handle medication, most of the TMH classrooms have limited access to a full-time school nurse. About 10% of the children are responsible for taking their own medication at school. Four times as many convulsive disordered children self-medicate as children treated for behavior disorders. One explanation for this discrepancy is the possiblity that children with behavior disorders cannot be "trusted" to take their own medication either because of the behavior problems themselves or concomitant factors, e.g., immaturity for which there is considerable support (Wender, 1971). When asked if the medication was actually handed to the child, teachers indicated that for 75% of the children, such was the case. However, less than half of those who pick up their own pills are described as medicating themselves. This gives some support that the notion of showing the child where his medication is but not handing it to him as a means of avoiding liability is still somewhat popular. However, the degree of developmental delay exhibited by TMH children may affect the feasibility of such a procedure for many. What to some may be an oversight is the fact teachers were certain that for 25% of students who took medication during school hours there were no instructions from the doctor about dosage and schedule, for 14% no permission letter from the parent to give medication at school, and for 55% no record was kept of daily drug administrations. There is considerable variation in the way medication was stored at school, but for 68% of the children, medication was kept in a locked container.

The degree to which states have developed procedures for the aministration of medication at school is extremely limited. In 1974, Appleman conducted a survey of all 50 states about the existence of such procedures receiving responses from all but eight states. The results showed that only "three states have laws, four states have regulations, and six states have guidelines relating to the use of any medication [during school hours]" p. 83. The Illinois Office of Education (1977) has developed a set of recommended guidelines entitled, "Suggested Procedures for the Administration of Medicine," to help school districts establish their own policy about medication. Briefly, the suggested procedures include: (1) a written statement should be provided by physician about medication (schedule, dosage, etc.); (2) a permission letter should be obtained from parent to give medicine at school; (3) medication must be brought to school in an appropriate container; (4) the school nurse must administer the first dose and prepare a written statement about the drug regimen, side effects, etc. for the child's file; and (5) drugs must be stored in a locked cabinet. The guidelines also state the school district has a right to reject requests to administer medicine at school. The Council for Exceptional Children (1977) has published a similar set of suggested guidelines about medication in Special Education

Administrative Policies for State and Local Education Agencies. In addition to the procedures suggested in the Illinois guidelines, the CEC publication recommends that: (1) school personnel have the right to refuse to administer medication if the suggested procedures are not followed; (2) the professional administering medication should be forewarned in writing about the possibility of being held negligent and personally liable to court action if a mistake is made; and (3) if a full-time nurse is available all drugs are to be locked in her office, and if not, they are to be locked in the administrator's office. Also, a physician's approval form is required for a child to bring prescription medicine to school for purposes of self-medication. Although the logic behind these procedures is self-evident, there is a tragic irony in that if not implimented wisely they may cause emotional problems for the child. For example, it is quite conceivable that schools could refuse to administer medication at all. In a previous study (Gadow, 1977b), the investigator talked with a school official who, desiring to demonstrate his administrative savvy, said they did not administer any medication at school. With great enthusiasm he described how their lawyer had advised against it. This policy must be well received by the parents of epileptic children knowing the school is so concerned about the welfare of students. If these procedures were thoughtlessly adhered to, negligent parents and busy doctors could keep a number of children from school by not returning school forms on time. The heavy reliance on the school nurse in some guidelines as the only means of medication administration also has drawbacks. One can easily envision "pill call" with children lined up outside the nurses office. What this experience means to the child can only be speculated about at this time (Whalen & Henker, 1976). Recent efforts in the direction of noncategorization, mainstreaming, and deinstitutionalization are all aimed at making the exceptional individual's life more "normal." Considering the social and emotional problems which are often associated with chronic childhood disorders, school procedures for administering medication should not stigmatize or hinder adjustment. As educators, our concerns about drug therapy should be focused on the best interests of the child, both medical and psychological. Perhaps the most revealing aspect of school guidelines about drug treatment is the complete lack of any discussion on the role of the teacher in drug treatment or procedures whereby the school can at least attempt to provide the best possible delivery of services for the child. Although efforts to limit the unnecessary administration of medication at school and prevent accidental poisonings and injury due to mismanagement of the drug regimen are to be lauded, it is the impression of this investigator that concerns about drug treatment are often narrowly defined and in some instances, not really aimed at helping children.

Problems Teachers Encounter with Children

Receiving Medication

The results of this study corroberate teacher reports of the problems they encounter with children on medication, their parents,

and doctors. The need for more information about when drugs are being used, what effect they will have on the child's behavior, side effects, changes in the drug regimen, and general information through teacher training programs is the teacher's biggest problem with drug treatment. It is difficult to participate in a meaningful way without at least the basic information about drug treatment. Teachers feel parents are also poorly informed, for whatever reason, and as a result, are a poor source of information. The data about teacher involvement in the drug regimens for both behavior and convulsive disorders show very little contact with the physician, and when interaction does take place, the teacher usually talks with the parent. Not being adequately informed about drug treatment is part of a larger problem, the inability to participate in a meaningful way in the drug regimen. Exclusion from the decision making process to initiate and terminate drug treatment was a disappointment for a number of teachers. Not being able to report evaluations of drug treatment to the people teachers feel should hear them, not being asked to make evaluations, and being ignored or rebuked when such efforts are made are all examples of this problem. Data collected about specific children receiving medication support the accuracy of these concerns as well as graphically demonstrate the disparity between models for adequate treatment and the realities of everyday practices.

Second only to exclusion from a meaningful role in drug treatment is the problem of parents and doctors failing to do what teachers expect them to do in the best interests of the child. Parent departure from role expectations is perceived by teachers as negligence and noncompliance to physician instructions. Teachers feel parents are inconsistent and irregular in the way they administer medication, either forgetting to give it or not sending it to school when the prescription runs out. Teacher suspicious about noncompliance are based on inconsistencies in behavior, seizures at school, and forgetfulness in sending prescription refills to school on time. Physician departure from role expectations, according to teachers, is evidenced by a failure to monitor the child adequately. Studies of physician practices support the validity of this observation (Sprague & Gadow, 1976). Without analyzing each child in a case-by-case fashion and interviewing the teacher, parent, and physician, it is difficult to assess the degree of parent noncompliance and the reasons for their behavior. Studies have shown that, according to parents, many are permitted by the doctor to adjust dosage and change the schedule as well as give medication for special situations (Gadow, 1977a; Solomons, 1973). Although beyond the scope of this study, equally important for efforts to improve the delivery of services is the analysis of the problems doctors encounter working with parents and teachers.

Another major problem area according to teachers has to do with the drug regimen both in terms of drug effects, difficulty assessing the effect of medication, and procedural problems. Side effects, especially those that impair school performance, are frequently reported by teachers. The seriousness of this problem is evidenced by the number of children receiving anticonvulsant drugs described as being drowsy or sleepy. Considering that phenobarbital may cause behavior problems (Livingston, 1972), that major tranquilizers,

especially at higher dosages, cause impairments in cognitive performance (Hartlage, 1965) and suppression of adaptive behavior (Marholin & Phillips, 1976), that stimulants may cause a depression-like reaction (Gadow, 1977b), and that drugs can aggrevate a disorder (Reynolds, 1975; Safer & Allen, 1976; Stores, 1975), it would appear to be judicious to involve the school in the evaluation of drug effects. The way in which evaluations are made, however, is also a problem. Teachers feel there should be more scientific ways (behavioral rating scales) for assessing whether or not drug treatment is really helping a child. Changing drugs and dosages may be quite necessary in order to find an effective agent, but these procedures may produce marked variability in bheavior as well as a variety of side effects. Although a number of these problems are inherent in this treatment modality, an explanation of what to expect and why things are being done the way they are may be helpful for both parents and teachers. If nothing else, such information could dispell concerns about whether or not what is being done is in the child's best interest.

Summary

The objectives of this study were to determine: (1) the prevalence and type of psychotropic and antiepileptic drug use, (2) teacher experience, training, and involvement in drug treatment, (3) how drugs were administered at school, and (4) the types of problems teachers encounter with children receiving medication. Briefly, drug treatment was found to be extensive compared to other public school populations, and teachers had considerable experience with children receiving medication. Teacher training about drug therapy, both college and inservice, was trivial. Most of what teachers do learn is through personal experience. Teacher participation in the drug regimen falls far short of what is advocated by clinicians and researchers, but is significant from the standpoint that there are few state and local guidelines concerning the role of school staff members in each phase of drug treatment. Data about the manner in which drugs are administered at school imply that a variety of different methods are being used. Although it would be comforting to infer that this diversity is the result of individually taylored procedures based on the child's needs, it is more probable that school policy simply varies from district to district. The major problem with drug treatment encountered by teachers is exclusion from meaningful involvement in what should be a team effort. Ways in which this problem could be remedied are discussed in the following section.

SUGGESTIONS AND RECOMMENDATIONS

Goals for improving the delivery of services for children in TMH programs receiving psychotropic and antiepileptic drug treatment should include the following: (1) more information and training about drug treatment for teachers, (2) better channels of communications between parent, teacher, and doctor, and greater teacher participation in the drug treatment, (4) procedures for limiting the degree of parent non-compliance, and (5) procedures for improving physician practices. The last two problem areas pose some of the greatest challenges to the school. It would be erroneous to infer from this discussion that teachers should preempt a medical role--quite the contrary. Guidelines for the involvement of school personnel in drug treatment should focus on reducing the occurrence of such situations. The following suggestions are based on the premise that any meaningful change in the delivery of services must come from educators. No one else will solve these problems. The psycho-social aspects of drug teatment for behavior and convulsive disorders as well as for other medically defined maladies have not been, and in all probability will not be, attended to in any measurable way by the health professions (Engel, 1977).

The need for information about drug treatment presents problems on two levels: (1) more detailed data about specific children receiving drug treatment, and (2) teacher training in general. The first problem focuses on the parents because they are the primary source of teacher information about drug use. By using existing procedures for informing parents about school interests, school personnel can impress upon parents the importance of providing the necessary information about medication. Through parent conferences, group meetings, newsletters, etc., the school can tell parents exactly the types of things they would like to know, as well as the rationale behind such requests, and <u>how</u> they should inform the school. Developing school forms that are easy to understand and complete and designating a school staff member through which medication information should pass may also help solve the problem of unreported changes in the drug regimen during the school year. If drug information is supplied initially to someone other than the teacher, e.g., the school nurse, it will be of little value to the teacher unless relayed to her. (Because so much of the interest in drug treatment is based on the effect of medication on school performance, the development of teacher competencies should be one of the objectives of school policy.) Creating the awareness that the school is interested in medication information and <u>why</u> may go a long way in solving some problems. By obtaining the parent's consent to exchange information with the child's doctor when medication forms are completed may also be helpful. For example, if it is hard to obtain acccurate information from the parent, sending a medication and parent consent form to the child's physician <u>may</u> be productive.

The solution to the second part of the information problem, teacher training, must come from teacher training institutions, professional organizations, and state agencies in charge of education in the public schools. A major obstacle for many colleges of education is locating staff who are competent in teaching about drug treatment. It is very likely that persons familiar with pediatric psychopharmacology will be

in disciplines other than education. If such people are used for education courses, care must be given to shape instruction to the needs of teachers. A teacher training course about drug therapy has been developed in the Department of Special Education at the University of Illinois. A detailed course outline is available for educators interested in developing teacher competencies in psychotropic and anticonvulsant drug treatment (Sprague & Gadow, 1976). To date, only a few universities presently offer such courses in teacher preparation programs. Inservice training also has considerable potential for meeting the information needs of the many working teachers who regularly encounter children on medication. The Council for Exceptional Children has taken the lead in this area by offering a 2-day institute entitled, "Drug Therapy with Children." At the local level, school districts could sponsor inservice training experiences using people from the health professions in their own communities as instructors. This would not only familiarize school personnel with some of the physicians that prescribe medication, but may also establish channels of communication between the school and the doctor. To date, state agencies have made little or no efforts to improve this situation. Related to the problem of teacher education is the need to develop training and reference materials to include books and films. Much of what is avilable is either aimed at medical audiences and therefore too technical or, if teacher oriented, the materials are too sophomoric for the level of understanding proposed in this study. Comprehensive texts about drug treatment, if available, would be valuable references for school libraries, particularly in special education facilities. Whatever procedures are used to increase the level of teacher knowledge and competence in working with children on medication, it would be naive to think that doctors will, or should, play a significant role.

The second problem area, greater school participation in the drug regimen and more communication between parent, tacher, and doctor, may be improved by adopting staffing and referral procedures that actively involve the parent and, when possible, the child's doctor. Such involvement would communicate to the parent and physician a willingness on behalf of the school to work in a cooperative manner for the well-being of the child. Ways for evaluating medication effects could be discussed as well as procedures for providing feedback from both parents and doctor. Granted, such procedures would not be a total safeguard against inappropriate behavior by school personnel (Bruck, 1976), but they would be an improvement over leaving decisions up to individual teachers completely. Although a staffing procedure would set the stage for active participation by the school, only a small percentage of children are actually placed on drug treatment during the school year. Most children are enrolled already on medication, and this presents some special challenges. The school could communicate a desire to assist both parents and doctors with drug treatment through the use of standardized form letters. Such letters might express a willingness to provide evaluations of the child's behavior, participate in drug-free periods, report side effects, etc.,

and demonstrate an interest in receiving information that may be helpful to the teacher. (There will obviously still be parents and physicians who, for whatever reason, will refuse to involve the school in the child's health care.) Parents may be interested in, or even request, information about doctors who have been cooperative in working with the school. This may be quite helpful to the parent of a handicapped child who is searching for a doctor who is not only skilled in treating childhood disorders, but who is also receptive to having an exceptional child as a patient. Although such an idea evokes fears in some that an educational-medical conspiracy could place numbers of children in chemical straightjackets, evidence that this is a problem has yet to be presented.

The fact that there are so few guidelines for the teacher's role in drug treatment creates ambiguity as to what is appropriate and what is in the child's best interests. This constitutes the third problem. As already discussed, this is a national problem; few states have any guidelines whatsoever. Such policy statements are needed to prevent teachers from assuming a medical role, e.g., making a diagnosis or recommending to a parent that their child should be on medication. However, these guidlines should not become just a series of "don'ts." Such an attitude leads only to a partial description of the situation. Equally important are those things which should be done to ensure the best possible care, e.g., procedures for reporting side effects which impair school performance. A discussion guide for the development of a school policy has been developed (Gadow, 1977b), but whether guidelines can be implemented at the local level, without state and federal leadership remains to be seen. Regardless, it is only a matter of time before court cases involving the public schools (Bruck, 1976) and residential facilities for the mentally retarded (Sprague, 1977) provide the necessary impetus to attend to this issue with the urgency it demands.

The last two problem areas concern departures from teacher role expectations, primarily physicians not doing what they are supposed to and parents doing things they should not. Parent problems are perceived by teachers as forgetting to give medicaiton, changing the dosage and schedule, terminating treatment on their own, etc., without the approval of the doctor. In the case of psychotropic and antiepileptic drugs, such manipulations can result in considerable variability in the child's behavior. Although compliance may be considered a medical matter, other professions, e.g., pharmacists, have been used to increase compliant behavior (Lima, Nazarian, Charney, & Lahti, 1976). It may be tempting to consider parental misuse of medication as an example of child abuse. What the role of the school should be in this matter is unclear. For example, what should a teacher do if she suspects medication is being administered inappropriately? Although a few states have incorporated medical negligence into their guidelines about child abuse, little discussion of drug therapy has appeared in the literature.

Teachers also feel physicians are not doing their job when they do not inform parents about the use of medication, fail to monitor drug treatment adequately, refuse to cooperate with the school, and prescribe drugs in a capricious manner. It is difficult to say to what extent the school can or should become involved in these problems.

If doctors are unresponsive to the procedures already suggested, there is little the school can do. The fact that refusal to respond to school requests is a possible outcome, however, should not inhibit at least making an effort to encourage cooperation. It would have been very desirable to gather information from the physicians of these children about the types of problems they encounter with parents and teachers to get a more comprehensive view of the entire treatment setting. However, considerable obstacles would have to be overcome to do this on a state-wide basis and still obtain a satisfactory response rate.

The results from this study clearly demonstrate that there are a number of problems with the way in which psychotropic and antiepileptic drug treatment is managed, and that much remains to be learned about the psychosocial aspects of drug therapy. Much of our present ignorance is due, in part, to the way the medical model conceptualizes the origins of disease and treatment strategies. In an excellent paper on the need to develop a biopsychosocial approach to the treatment of illness, Engel (1977) describes this situation as "medicine's crisis" which "stems from the logical inference that [because] 'disease' is defined in terms of somatic parameters, physicians need not be concerned with psychosocial issues which lie outside medicine's responsibility and authority" (p. 129). The data from this study bear witness to the very real problems created by such an approach to health care. Although the development of behavioral pediatrics has been heralded with much enthusiasm (Richmond, 1975), it remains to be seen if there will be a dramatic change in the way services are provided. For example, will this new orientation mean the physician will have the time to serve as an interdisciplinary team member, direct behavioral intervention strategies, and train parents? Or, if this is not a good use of the doctor's expertise and time, will the children and their families be referred to the appropriate health care services? Whether or not the medical profession will reorient itself is debatable and the challenge is considerable because "nothing will change unless or until those who control resources have the wisdom to venture off the beaten path of exclusive reliance on biomedicine as the only approach to health care" (Engel, 1977, p. 135). Regardless of the outcome, there are a number of pressing problems which cannot await reforms in the training of doctors. It is imperative that the federal agencies which fund behavioral and educational research support efforts to investigate the psychosocial aspects of drug therapy and develop delivery of services models for children receiving psychotropic and antiepileptic drugs that involve cooperation between school, family, and medical community. Considering that stimulant drugs alone have been prescribed for learning and behavior disorders for 40 years, such support is long overdue.

References Notes

1. Schain, R. J. Problems in the use of anticonvulsant drugs in the mentally retarded. Paper presented at the Workshop on Psychotropic Drugs and the Mentally Retarded at the meeting of the American Association on Mental Deficiency, Portland, Oregon, May 1975.

2. Gadow, K. D. Pills and preschool: Medication usage with young children in special education. Paper presented at the Illinois Council for Exceptional Children, Chicago, October 1975.

3. Safer, D. Personal communication, February 3, 1977.

References

Appelman, M. The legal issues involved in the use of stimulants on hyperactive school children. Unpublished doctoral dissertation, University of Minnesota, 1974.

Arnold, L. E. The art of medicating hyperkinetic children. Clinical Pediatrics, 1973, 12, 35-41.

Beck, L., Langford, W. S., Mackay, M., & Sum, G. Childhood chemotherapy and later drug abuse and growth curve: A follow-up study of 30 adolescents. American Journal of Psychiatry, 1975, 132, 436-438.

Blackwell, B., & Currah, J. The psychopharmacology of nocturnal enuresis. In I. Kalvin, R. C. MacKeith, & S. R. Meadow (Eds.), Bladder control and enuresis. London: William Heinemann Medical Book, 1972.

Bosco, J. J., & Robin, S. S. (Eds.). The hyperactive child and stimulant drugs. Chicago: University of Chicago Press, 1976.

Bruck, C. Battle lines in the Ritalin war. Human Behavior, August 1976, pp. 25-33.

Campbell, M. Pharmacotherapy in early infantile autism. Biological psychiatry, 1975, 10, 399-423. (a)

Campbell, M. Psychopharmacology in childhood psychosis. International Journal of Mental Health, 1975, 4, 238-254. (b)

Conners, C. K. Pharmacotherapy of psychopathology in children. In H. C. Quay and J. S. Werry (Eds.), Psychopathological disorders of childhood. New York: John Wiley & Sons, 1972.

Conners, C. K. What parents need to know about stimulant drugs and special education. Journal of Learning Disabilities,

Dekeban, A. S., & Lehman, E. J. B. Effects of different dosages of anticonvulsant drugs on mental performance in patients with chronic epilepsy. Acta Neurologica Scandinavica, 1975, 52, 319-330.

Denhoff, E. Cerebral palsy: Medical aspects. In W. M. Cruichshank (Ed.), Cerebral pasly: Its individual and community problems (2nd ed.). Syracuse, New York: Syracuse University Press, 1966.

DiMascio, A., Soltys, J. J., & Shader, R. I. Psychotropic drug side effects in children. In R. I. Shader & A. DiMascio (Eds.), Psychotropic drug side effects. Baltimore: Williams & Wilkins, 1970.

Divoky, D. Toward a nation of sedated children. Learning, March 1973, pp. 6-13.

Eisenberg, L. Symposium: Behavior modification by drugs III. The clinical use of stimulant drugs in children. Pediatrics, 1972, 49, 709-715.

Engel, G. L. The need for a new medical model: A challenge for biomedicine. Science, 1977, 1976, 129-135.

Epilepsy Foundation of America. Basic statistics on the epilepsies. Philadelphia: F. A. Davis, 1975.

Eyman, R. K., Moore, B. C., Capes, L., & Zachofsky, T. Maladaptive behavior of institutionalized retardates with seizures. American Journal of Mental Deficiency, 1970, 74, 651-659.

Fish, B. The "one child, one drug" myth of stimulants in hyperkinesis. Archives of General Psychiatry, 1971, 25, 193-203.

Freeman, R. D. Psychopharmacology and the retarded child. In F. Menolascino (Ed.), Psychiatric approaches to mental retardation. New York: Basic Books, 1970. (a)

Freeman, R. D. Use of psychoactive drugs for intellectually handicapped children. In N. R. Berstein (Ed.), Diminished people: Problems and care of the mentally retarded. Boston: Little, Brown & Co., 1970. (b)

Gadow, K. D. Psychotropic and anticonvulsant drug usage in early childhood special education programs I. Phase One: A preliminary report: Prevalence, attitude, training and problems. Paper presented at the annual meeting of the Council for Exceptional Children, Chicago, April 1976. (ERIC Document Reproduction Service No. ED 125 198)

Gadow, K. D. Psychotropic and anticonvulsant drug usage in early childhood special education programs III. A preliminary report: Parent interviews about drug treatment. Paper presented at the annual meeting of the Council for Exceptional Children, Atlanta, Georgia, April 1977. (a) (ERIC Document Reproduction Service No. ED 139 182)

Gadow, K. D. Psychotropic and antiepileptic drug treatment with children in early childhood special education. Final report, grant #00-75-00-381, Office of Education, Bureau of Education for the Handicapped, August 1977. (b) (ERIC Document Reproduction Service No. to be assigned)

Gadow, K. D., & Sprague, R. L. Children's medication chart. Champaign, IL: Institute for Child Behavior and Development, University of Illinois, 1975.

Gittelman-Klein, R. (Ed.). Recent advances in child psychopharmacology. International Journal of Mental Health, 1975, 4(1-2), 1-271.

Goldin, G. J., Perry, S. L., Margolin, R. J., Stotsky, B. A., & Foster, J. C. The rehabilitation of the young epileptic. Lexington, Mass.: Lexington Books, 1971.

Graham, P., & Rutter, M. Organic brain dysfunction and child psychiatric disorder. British Medical Journal, 1968, 3, 695-700.

Hartlage, L. C. Effects of chlorpromazine on learning. Psychological Bulletin, 1965, 64, 235-245.

Honigfeld, G., & Howard, A. Psychiatric drugs: A desk reference. New York: Academic Press, 1973.

Illinois Office of Education. Suggested procedures for the administration of medicine. Springfield, IL: 1977.

Jasper, H. H., Ward, A. A., & Pope, A. (Eds.). Basic mechanisms of the epilepsies. Boston: Little, Brown, 1969.

Jenkins, R. L., & Stable, G. Special characteristics of retarded children rated as severely hyperactive. Child Psychiatry and Human Development, 1971, 2, 26-31.

Katz, S., Saraf, K., Gittelman-Klein, R., & Klein, D. F. Clinical pharmacological management of hyperkinetic children. International Journal of Mental Health, 1975, 4, 157-181.

Krager, J. M., & Safer, D. J. Type and prevalence of medication used in the treatment of hyperactive children. New England Journal of Medicine, 1974, 291, 1118-1120.

Kutt, H. L. The use of blood levels of antiepileptic drugs in clinical practice. Pediatrics, 1974, 53, 557-560.

Ladd, E. T. Pills for classroom peace? Saturday Review, November 21, 1970, pp. 66-68; 81-83.

Lange, S. C., Julien, R. M., & Fowler, G. W. Biphasic effects of imipramine in experimental models of epilepsy. Epilepsia, 1976, 17, 183-196.

Leavitt, F. Drugs and behavior. Philadelphia: W. B. Saunders Co., 1974.

Lima, J., Nazarian, L., Charney, E., & Lahti, C. Compliance with short-term antimicrobia therapy: Some techniques that help. Pediatrics, 1976, 57, 383-386.

Lipman, R. S. The use of psychopharmacological agents in residential facilities for the retarded. In F. J. Menolascino (Ed.), Psychiatric approaches to mental retardation. New York: Basic Books, 1970.

Livingston, S. Comprehensive management of epilepsy in infancy, childhood and adolescence. Springfield, IL: Charles C. Thomas, 1972.

Loney, J., & Ordoña, T. T. Using cerebral stimulants to treat minimal brain dysfunction. American Journal of Orthopsychiatry, 1975, 45, 564-572.

Marholin, D., & Phillips, D. Methodological issues in psychopharmacological research: Chlorpromazine--a case in point. American Journal of Orthopsychiatry, 1976, 46, 477-495.

Millichap, J. G. Management of hyperkinetic behavior in children with epilepsy. Modern Treatment, 1969, 6, 1233-1246.

Office of Mental Retardation Coordination. Mental retardation activities of the Department of Health, Education, and Welfare (DHEW Publication No. OS-72-27.) Washington, D.C.: U.S. Government Printing Office, 1972.

Ounsted, C. The hyperkinetic syndrome in epileptic children. Lancet, 1955, 2, 303-311.

Payne, D., Johnson, R. C., & Abelson, R. B. Comprehensive description of institutionalized retardates in Western United States. Boulder, CO: Western Interstate Commission for Higher Education, 1969.

Physicians' desk reference (29th ed.). Oradell, NJ: Medical Economics, 1975.

Pietsch, S. (Ed.). The person with epilepsy: Life style, needs, expectations. Chicago: National Epilepsy League, 1977.

Rapoport, J. L., Quinn, P. O., Bradbard, G., Riddle, K. D., & Brooks, E. Imipramine and methylphenidate treatments of hyperactive boys. Archives of General Psychiatry, 1974, 30, 789-793.

Reynolds, E. H. Chronic antiepileptic toxicity: A review. Epilepsia, 1975, 16, 319-352.

Richmond, J. B. An idea whose time has arrived. Pediatric Clinics of North America, 1975, 22, 317-523.

Robin, S. S., & Bosco, J. J. Ritalin for school children: The teacher's perspective. Journal of School Health, 1973, 43, 624-628.

Robinson, N. M., & Robinson, H. B. The mentally retarded child. New York: McGrow-Hill, 1976.

Ross, D. M., & Ross, S. A. Hyperactivity: Research, Theory, and action. New York: John Wiley & Sons, 1976.

Rules and regulations to govern the administration and operation of special education. Springfield, IL: Office of Education, 1976.

Rutter, M. L. Psychiatry. In J. Wortis (Ed.), Mental retardation: An annual review (Vol. 3). New York: Grune & Stratton, 1971.

Rutter, M., Rizard, J., & Whitmore, K. (Eds.). Education, health, and behavior. London: Longmans, 1970.

Safer, D. J., & Allen, R. P. Single daily dose methylphenidate in hyperactive children. Diseases of the Nervous System, 1973, 34, 325-328.

Safer, D. J., & Allen, R. P. Hyperactive children: Diagnosis and management. Baltimore: University Park Press, 1976.

Schrag, P., & Divoky, D. The myth of the hyperactive child. New York: Patheon Books, 1975.

Silverman, M., & Lee, P. R. Pills, profits, and politics. Berkeley: University of California Press, 1974.

Slater, E., Cowie, V. The genetics of mental disorders. London: Oxford University Press, 1971.

Sleator, E. K., & von Neumann, A. Methylphenidate in the treatment of hyperkinetic children. Clinical Pediatrics, 1974, 13, 19-24.

Sleator, E. K., & Sprague, R. L. Pediatric pharmacotherapy. In W. G. Clark & J. del Guidice (Eds.), Principles of psychopharmacology (2nd ed.). New York: Academic Press, in press.

Solomons, G. Drug therapy: Initiation and follow-up. Annals of the New York Academy of Sciences, 1973, 205, 335-344.

Special education and administration policies for state and local education agencies. Reston, VA: Council for Exceptional Children, 1977.

Sprague, R. L. Overview of psychopharmacology for the retarded in the United States. In P. Mittler (Ed.). Research to practice in mental retardation (Vol. III). Baltimore: University Park Press, 1977.

Sprague, R. L., Christensen, D. E., & Werry, J. S. Experimental psychology and stimulant drugs. In C. K. Conners (Ed.), Clinical use of stimulant drugs in children. The Hague: Excerpta Medica, 1974.

Sprague, R. L., & Gadow, K. D. The role of the teacher in drug treatment. School Review, 1976, 85, 109-140.

Sprague, R. L., & Sleator, E. K. Effects of psychopharmacologic agents on learning disorders. Pediatric Clinics of North America, 1973, 20, 719-735.

Sprague, R. L., & Sleator, E. K. What is the proper dose of stimulant drugs in children? International Journal of Mental Health, 1975, 4, 75-104.

Sprague, R. L., & Sleator, E. K. Drugs and dosages: Implications for learning disabilities. In R. M. Knights & D. J. Bakker (Eds.), Neuropsychology of learning disorders: Theoretical approaches. Baltimore: University Park Press, 1976.

Sprague, R. L., & Werry, J. S. Methodology of pharmacological studies with the retarded. In N. R. Ellis (Ed.), International review of research in mental retardation (Vol. 5). New York: Academic Press, 1971.

Sprague, R. L., & Werry, J. S. Psychotropic drugs and handicapped children. In L. Mann & D. A. Sabatino (Eds.), The second review of special education. Philadelphia: JSE Press, 1974.

Stores, G. Studies of attention and seizure disorders. Developmental Medicine and Child Neurology, 1973, 15, 376-382.

Stores, G. Behavioral effects of anti-epileptic drugs. Developmental Medicine and Child Neurology, 1975, 17, 647-658.

Svensmark, O., & Buchthal, F. Diphenylhydantoin and phenobarbital: Serum levels in children. American Journal of Diseases in Children, 1964, 108, 82-87.

Usdin, E. Classification of psychopharmaca. In W. G. Clark & J. del Guidice (Eds.), Principles of psychopharmacology. New York: Academic Press, 1970.

Usdin, E., & Efron, D. H. Psychotropic drugs and related compounds (2nd ed., DHEW Publication No. 72-9074). Washington, D.C.: U.S. Government Printing Office, 1972.

Walker, S. Drugging the American child: We're too cavalier about hyperactivity. Psychology Today, December 1974, pp. 43-48.

Weithorn, C. J., & Ross, R. Who monitors medication? Journal of Learning Disabilities, 1975, 8, 458-461.

Wender, P. H. Minimal brain dysfunction in children. New York: Wiley-Interscience, 1971.

Whalen, C. K., & Henker, B. Psychostimulants and children: A review and analysis. Psychological Bulletin, 1976, 83, 1113-1130.

Winsberg, B. G., Yepes, L. E., & Bialer, I. Pharmacologic management of children with hyperactive/aggressive/inattentive behavior disorders. Clinical Pediatrics, 1976, 15, 471-477.

Table 1

Prevalence of Primary Drug Treated Disorders
with Children in TMH Programs

(Children = 3,306)[a]

Disorders	Frequency	Percent
Convulsive Disorders	332	10.04
Behavior Disorders	161	4.87
Convulsive and Behavior Disorders	60	1.81
Other Disorders	44	1.33
Total[b]	597	18.05

[a]Total number of children in TMH programs.

[b]Twenty-nine of the children receiving medication for behavior or convulsive disorders also received psychotropic drugs for another disorder.

Table 2

Distribution of Primary and Secondary Drug Treated Disorders Among Children Receiving Drug Therapy

(Children = 597)[a]

Disorder	Frequency	Percent
Convulsive Disorders	332	55.6
Behavior Disorders	161	27.0
Convulsive and Behavior Disorders	60	10.1
Cerebral Palsy	22	3.7
Anxiety, Nervousness	16	2.7
Enuresis	8	1.3
Extrapyramidal syndromes	7	1.2
Sleep	2	0.3
Other	8	1.3
Total[b]	616	103.2

[a]Total number of children reported to have received drug treatment at some time during the school year.

[b]Totals are inflated because 29 children received medication for more than one disorder.

Table 3

Prevalence of Specific and Grouped Psychotropic and Anticonvulsant Drug Use in TMH Programs

(Children = 597)[a]

Generic Name	Trade Name	Frequency
1. Anticonvulsants		(432)
Phenytoin	Dilantin, Ekko	227
Primidone	Mysoline	73
Carbamazepine	Tegretol	29
Acetazolamide	Diamox	26
Ethosuximide	Zarontin	23
Clonazepam	Clonopin	20
Mephobarbital	Mebaral	14
Methsuximide	Celontin	11
Mephenytoin	Mesantoin	3
Trimethadione	Tridione	3
Phenacemide	Phenurone	2
(Fixed Ratio Product)	Phelantin	1
2. Hypnotics & Sedatives		(208)
Phenobarbital	Eskabarb	204
Chloral hydrate		2
Sodium butabarbital	Butisol	1
Sodium pentobarbital	Nembutal	1
3. Stimulants		(123)
Methylphenidate hcl	Ritalin	90
Magnesium pemoline	Cylert	16
Dextroamphetamine sulfate	Dexedrine	12
Deanol	Deaner	3
Amphetamine sulfate	Benzedrine	1
Methamphetamine hcl	Desoxyn	1
4. Major Tranquilizers		(87)
Thioridazine	Mellaril	51
Chlorpromazine	Thorazine	18
Haloperidol	Haldol	7
Trifluoperazine hcl	Stelazine	6
Fluphenazine hcl	Prolixin	3
Thiothixene hcl	Navane	1
Reserpine		1

Table 3 (Continued)

Generic Name	Trade Name	Frequency	
5. Minor Tranquilizers			(65)
Diazepam	Valium	46	
Hydroxyzine hcl	Atarax	10	
Hydroxyzine pamoate	Vistaril	1	
Chlordiazepoxide hcl	Librium	5	
Meprobamate	Meprospan	2	
Oxazepam	Serax	1	
6. Antidepressants			(21)
Imipramine hcl	Tofranil	18	
Amitriptyline hcl	Elavil	2	
Nortriptyline hcl	Aventyl	1	
7. Antiparkinson			(7)
Benztropine mesylate	Cogentin	4	
Trihexyphenidyl hcl	Artane	3	
7. Miscellaneous			(61)
Dantroline sodium	Dantrium	7	
Diphenhydramine hcl	Benadryl	4	
(Fixed Ratio Product)	Phenergan	4	
(Fixed Ratio Product)	Donnatal	3	
Prednisone		2	
Cyproheptadine hcl	Periactin	1	
(Fixed Ratio Product)	Triavil	1	
ACTH		1	
Unknown		38	
Total[b]		1,004	

[a]Total number of children who reportedly received drug treatment.
[b]Total is inflated because 271 children received more than one drug during the school year.

Table 4

Drugs Reportedly Used in the Management of Convulsive Disorders

(Children = 332)

Generic Name	Trade Name	Frequency
Phenytoin	Dilantin	186
Phenobarbital	Eskabarb	166
Primidone	Mysoline	62
Carbamazepine	Tegretol	26
Acetazolamide	Diamox	22
Ethosuximide	Zarontin	22
Clonazepam	Clonopin	19
Diazepam	Valium	18
Mephobarbital	Mebaral	13
Methsuximide	Celontin	7
Mephenytoin	Mesantoin	2
Trimethadione	Tridione	2
Phenacemide	Phenurone	2
ACTH		1
Prednisone		1
(Fixed Ratio Product)	Phelantin	1
	Unknown	19
Total[a]		569

[a]Total is inflated because 177 children received more than one drug during the school year.

Table 5

Drugs Reportedly Used in the Management of Behavior Disorders

(Children = 161)

Generic Name	Trade Name	Frequency
1. Stimulants		(90)
Methylphenidate hcl	Ritalin	68
Magnesium pemoline	Cylert	11
Dextroamphetamine sulfate	Dexedrine	9
Other		2
2. Major Tranquilizers		(68)
Thioridazine	Mellaril	40
Chlorpromazine	Thorazine	12
Haloperidol	Haldol	6
Trifluoperazine hcl	Stelazine	5
Fluphenazine hcl	Prolixin	3
Other		2
3. Minor Tranquilizers		(12)
Diazepam	Valium	7
Hydroxyzine hcl	Atarax	2
Chlordiazepoxide hcl	Librium	2
Hydroxyzine pamoate	Vistaril	1
4. Miscellaneous		(31)
Imipramine	Tofranil	9
Phenobarbital		6
Phenytoin	Dilantin	3
Diphenhydramine hcl	Benadryl	2
Amitriptyline hcl	Elavil	2
(Fixed Ratio Product)	Phenergan	2
Other		3
	Unknown	4
Total[a]		201

[a]Total is inflated because 34 children received more than one drug during the school year.

Table 6

Drugs Reportedly Administered to Children with Both Convulsive and Behavior Disorders

(Children = 60)

Generic Name	Trade Name	Frequency
	Drugs Prescribed for Convulsive Disorders	
Phenytoin	Dilantin	38
Phenobarbital		23
Primidone	Mysoline	10
Methsuximide	Celontin	4
Carbamazepine	Tegretol	3
Diazepam	Valium	3
Acetazolamide	Diamox	2
Other		5
	Unknown	3
Total[a]		91
	Drugs Prescribed for Behavior Disorders	
Methylphenidate hcl	Ritalin	21
Thioridazine	Mellaril	6
Chlorpromazine	Thorazine	6
Hydroxyzine hcl	Atarax	6
Magnesium pemolinee	Cylert	5
Diazepam	Valium	3
Dextroamphetamine sulfate	Dexedrine	2
Deanol	Deaner	2
Imipramine hcl	Tofranil	2
Other		8
	Unknown	2
Total[a]		63

[a]Totals are inflated because children received more than one drug for each disorder during the school year.

Table 7

General Problems with Drug Treatment

(Teachers = 264)[a]

Problem Area	Frequency[b]	Percent[c]
Communication	(84)	(15.2)
General	14	
Teacher-Doctor	32	
Parent-Doctor	2	
Teacher-Parent	8	
Parent-Teacher-Doctor	28	
Participation	(36)	(6.5)
Information	(156)	(28.3)
Teacher is not informed	76	
Parent is not informed	29	
Doctor is not informed	4	
Doctor does not inform teacher	19	
Parent does not inform teacher	26	
Doctor does not inform parent	2	
Choice of Treatment	(28)	(5.1)
Role Expectations	(117)	(21.2)
Doctor	43	
Parent	71	
Teacher	3	
Drug Regimen	(97)	(17.6)
Giving Medication at School	(27)	(4.9)
Other	(6)	(1.2)
Total[d]	551	100.0

[a] Problems were not reported by 65 teachers.
[b] Numbers in parentheses are the values for problem categories.
[c] Percentages are based on the total number of problems reported.
[d] Total is inflated because teachers were permitted multiple responses.

Table 8

Teacher Involvement in the Anticonvulsant drug Regimen

Item	CD(n=241)[a]		CD/BD(n=26)	
	F	%	F	%
Informed of what to expect if child had a seizure at school				
Yes	109	45.4	11	42.3
No	131	54.6	15	57.7
Total	240	100.0	26	100.0
Told how to manage child's seizures				
Yes	117	48.8	11	42.3
No	123	51.2	15	57.7
Total	240	100.0	26	100.0
Report occurance of seizures to anyone				
Yes	93	94.9	5	100.0
No	5	5.1	0	0.0
Total[b]	98	100.0	5	100.0
Describe seizures to assist doctor				
Yes	53	55.2	3	60.0
No	43	44.8	2	40.0
Total[b]	96	100.0	5	100.0
Report effect of medication on child's behavior				
Yes	94	41.0	14	56.0
No	135	59.0	11	44.0
Total	229	100.0	25	100.0
Report side effects of medication				
Yes	65	29.7	8	33.3
No	154	70.3	16	66.7
Total	219	100.0	24	100.0

[a] Smaller totals indicate missing data.
[b] Tabulated for those teachers reporting seizures at school.

Table 9

Seizure Type and Occurence at School

Item	CD(n=241)[a]		CD/BD(n=26)	
	F	%	F	%
Do you know seizure type				
Yes	149	64.2	14	56.0
No	83	35.8	11	44.0
Total	232	100.0	25	100.0
Seisure type[b]				
Individual	(n=110)		(n=9)	
Grand mal	65	59.1	6	66.7
Petit mal	30	27.3	0	0.0
Psychomotor	6	5.5	2	22.2
Petit mal varient	4	3.6	0	0.0
Other	5	4.5	1	11.1
Total	110	100.0	9	100.0
Mixed	(n=39)		(n=4)	
Grand mal	33	84.6	3	75.0
Petit mal	30	76.9	2	50.0
Psychomotor	5	12.8	1	25.0
Petit mal varient	3	7.7	1	25.0
Minor motor	3	7.7	1	25.0
Myoclonic	3	7.7	0	0.0
Other	1	2.6	0	0.0
Total	78	200.0	8	200.0
Does child have seizures at school				
Yes	98	41.4	5	20.0
No	139	58.6	20	80.0
Total	237	100.0	25	100.0
Do you keep a record of the seizures[b]				
Yes	52	53.6	2	40.0
No	46	47.4	3	60.0
Total	98	100.0	5	100.0

[a]Smaller totals indicate missing data.

[b]Tabulated for teachers responding affirmatively to previous item.

Table 10

Characteristics of Children Receiving Antiepileptic Drugs[a]

Characteristic	CD(n=241)[b]		CD/BD(n=26)	
	F	%	F	%
More drowsy or sleepy				
Yes	83	37.2	6	28.6
No	140	62.8	15	71.4
Have more blank stares				
Yes	117	51.3	8	33.3
No	111	48.7	16	66.7
More spaced out, off in another world				
Yes	103	45.6	10	41.7
No	123	54.4	14	58.3
Poorer coordination or balance				
Yes	126	58.8	11	45.8
No	100	44.2	13	54.2
More confused				
Yes	89	40.1	10	45.5
No	133	59.9	12	54.5

[a]Teachers were asked to compare the child receiving antiepileptic drugs to the other children in the class.

[b]Smaller totals indicate missing data.

Table 11

Teacher Participation in the Diagnostic Phase of the Drug Regimen for Behavior Disorders

(Children = 118)

Item	Frequency	Percent
Was this child already receiving medication when he/she entered school this year?		
Yes	95	80.5
No	14	11.9
Uncertain	9	7.6
Total	118	100.0
Before medication was prescribed, did you suggest the child should be seen by a doctor?		
Yes	7	53.8
No	6	46.2
Total	13	100.0
Before medication was prescribed, did you suggest this child might benefit from medication?		
Yes	5	38.5
No	8	61.5
Total	13	100.0
Did you make an evaluation of this child's behavior to assist the doctor in making a diagnosis?		
Yes	4	30.8
No	9	69.2
Total	13	100.0

[a]Item pertains to only those children who were placed on medication during the school year (n=14).

Table 12

Teacher Participation in the Evaluation of Drug Treatment for Behavior Disorders

(Children = 118)

Item	Frequency	Percent
Did you report the effect of the medication on the child's behavior?		
Yes	70	59.8
No	47	40.2
Total	117	100.0
Did you suggest the dosage be changed?		
Yes	37	31.6
No	80	68.4
Total	117	100.0
Did you report side effects of the medication?		
Yes	46	39.3
No	71	60.7
Total	117	100.0
Did you evaluate the effect of the medication on the child's behavior using a behavior rating scale?		
Yes	11	9.5
No	105	90.5
Total	106	100.0

Table 13

Teacher Perceptions of Therapeutic Improvement with Drug Treatment

Item[a]	On (n=94)[b]		Off (n=24)	
	F	%	F	%
Reduced hyperactivity				
Yes	51	54.8	5	21.7
Uncertain	26	28.0	10	43.5
No	16	17.2	8	34.8
Total	93	100.0	23	100.0
Improved attention				
Yes	43	48.3	5	21.8
Uncertain	26	29.2	9	39.1
No	20	22.5	9	39.1
Total	89	100.0	24	100.0
Improved peer relations				
Yes	41	44.6	2	8.7
Uncertain	24	26.1	10	43.5
No	27	29.3	11	47.8
Total	92	100.0	23	100.0
Helped child				
Yes	59	64.1	6	25.0
Uncertain	25	27.2	9	37.5
No	8	8.7	9	37.5
Total	92	100.0	24	100.0

[a]Children actively receiving medication are designated "on"; children no longer on drug treatment are designated "off".

[b]Smaller totals indicate missing data.

Table 14

Teacher Perceptions of Therapeutic Improvement on Medication

(Children = 65)[a]

Response Category	Frequency
Activity	(40)
Reduces hyperactivity	17
More calm	17
Remains in seat longer	2
Slows child down	4
Attention, distractibility	(22)
Better attention to tasks	17
Less distractable	3
Other	2
Behavior Problems	(14)
Less aggressive	6
Fewer temper tantrums	4
Less easily frustrated	3
Less troublesome	1
Manageability	(7)
More cooperative	3
Better self control	3
More manageable	1
Other	(17)
Controls excessive talking	2
Less nervous	3
Miscellaneous	12

[a]Tabulated for children teachers reported as improved on medication.

Table 15

Termination of Drug Treatment for Behavior Disorders

(Children = 118)[a]

Item	Frequency	Percent
Was medication terminated during school year?		
Yes	23	19.7
No	88	75.2
Uncertain	6	5.1
Total	117	100.0
Did you participate in decision to terminate medication?		
Yes	10	43.5
No	13	56.5
Total[b]	23	100.0
Who initiated idea to stop medication?[c]		
Parent	16	72.7
Doctor	6	27.3
Teacher	5	22.7
School staff	1	4.5
Total	28	127.2
Did child have drug-free period to assess continued need for treatment?		
Yes	22	18.8
No	75	64.1
Uncertain	20	17.1
Total	117	100.0
Have you seen child off medication?		
Yes	62	52.6
No	47	39.8
Uncertain	9	7.6
Total	118	100.0

[a]Smaller totals indicate missing data.
[b]Tabulated for affirmative responses in previous item.
[c]Respondents were permitted multiple responses.

Table 16

Frequency of Teacher Interaction with Parent and Doctor about Medication During the School Year[a]

Person	CD	BD	CD/BD	Total	
	F	F	F	F	%
Number of times talked with parents about medication					
None	63	17	5	85	22.3
1	52	22	4	78	20.5
2	41	31	7	79	20.7
3	28	15	3	46	12.1
4	25	9	1	35	9.2
5 or more	30	24	4	58	15.2
Total	239	118	24	381	100.0
Number of times talked with the doctor about medication					
None	218	107	25	350	92.1
1	11	8	0	19	5.0
2	6	3	0	9	2.4
3 or more	2	0	0	2	0.5
Total	237	118	25	380	100.0

[a]Total number of respondents for each category is as follows: CD(n=241), BD(n=118), and CD/BD(n=26). Smaller n's indicate missing data.

Table 17

Side Effects

Item	CD	BD	CD/BD	Total	
	F	F	F	F	%
Observed side effects	(n=241)[a]	(n=118)	(n=26)	(n=385)	
Yes	72	36	5	113	29.8
No	137	67	12	216	57.0
Uncertain	30	12	8	50	13.2
Total	239	115	25	379	100.0
Informed of side effects	(n=241)	(n=118)	(n=26)	(n=385)	
Yes	63	33	2	98	25.8
No	174	85	23	282	74.2
Total	237	118	25	380	100.0
Source of information:	(n=58)	(n=30)	(n=2)	(n=90)	
Parent	22	11	2	35	38.9
School nurse	22	16	0	38	42.2
Teacher already knew	13	5	0	18	20.0
Doctor	8	5	0	13	14.4
Other[b]	0	1	0	1	1.1
Total	65	38	2	105	

[a]Smaller totals indicate missing data.

[b]Respondents were permitted multiple responses.

Table 18

Administration of Medication at School

Item	CD	BD	CD/BD	Total	
	F	F	F	F	%
Receives medication at school[a]	(n=240)	(n=118)	(n=25)	(n=383)	
Yes	116	78	16	210	54.8
No	124	40	9	173	45.2
Who administers the medication					
Teacher	49	42	8	99	47.8
School nurse	45	27	5	77	37.2
Child	19	3	0	22	10.6
Teacher aide	4	13	2	19	9.2
Secretary	2	1	0	3	1.4
Total[b]	119	86	15	220	106.2
Medication handed to child					
Yes	82	63	14	159	75.7
No	33	12	2	47	22.3
Uncertain	1	3	0	4	2.0
Total	116	78	16	210	100.0
Written instructions from doctor					
Yes	77	55	11	143	68.1
No	31	16	5	52	24.8
Uncertain	8	7	0	15	7.1
Total	116	78	16	210	100.0
Permission letter from parent					
Yes	93	58	12	163	77.6
No	16	11	3	30	14.3
Uncertain	7	9	1	17	8.1
Total	116	78	16	210	100.0
Daily record of administrations					
Yes	51	30	6	87	41.4
No	60	45	10	115	54.8
Uncertain	5	3	0	8	3.8
Total	116	78	16	210	100.0

[a]Total number of respondents for each category is as follows: CD(n=241), BD(n=118), and CD/BD(n=26). Smaller n's indicate missing data.

[b]Totals are inflated because respondents were permitted more than one response.

Table 19

Problems Teachers Encountered with Children Receiving Drug Treatment for Behavior and Convulsive Disorders

Problem Areas	CD(n=81)		BD(n=61)	
Communication		(6)		(3)
Teacher-Doctor	2		1	
Parent-Doctor	0		0	
Parent-Teacher	2		2	
Parent-Teacher-Doctor	2		0	
Participation		(2)		(7)
Information		(20)		(5)
Teacher is not informed	9		3	
Parent is not informed	2		0	
Doctor does not inform teacher	4		0	
Parent does not inform teacher	4		1	
Doctor does not inform parent	0		0	
Other	1		1	
Choice of Treatment		(6)		(12)
Role Expectations		(14)		(15)
Parent	14		12	
Doctor	0		3	
Drug Regimen		(65)		(46)
Giving Medication at School		(5)		(1)
Other		(6)		(0)
Total[a]		(124)		(89)

[a]Totals are inflated because respondents were permitted multiple responses.